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FORMATIVE EVALUATION

CAVE AND BASIN CENTENNIAL CENTRE

SUMMER 1982

FINAL REPORT

MARCH 1983

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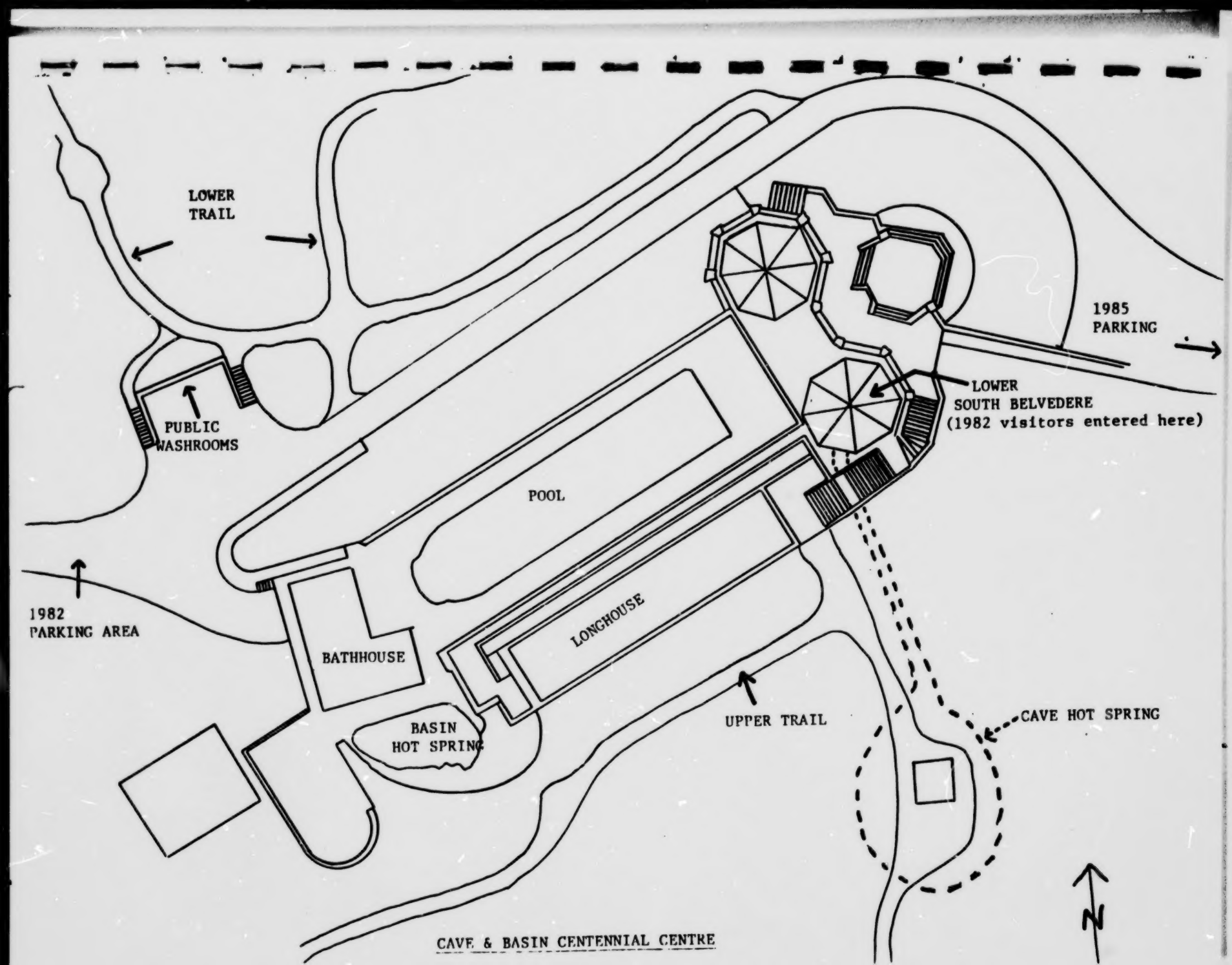
LOWER
TRAIL
1985
PARKING
LOWER
SOUTH BELVEDERE
(1982 visitors entered here)
PUBLIC
WASHROOMS
POOL
1982
PARKING AREA
BATHHOUSE
LONGHOUSE
BASIN
HOT SPRING
UPPER TRAIL
CAVE HOT SPRING
N
CAVE & BASIN CENTENNIAL CENTRE

INTRODUCTION

The Cave and Basin Centennial Centre conducted a pilot project for Parks Canada in the formative evaluation of the centre's future exhibits during the summer of 1982. Formative evaluation refers to the testing of the communication effectiveness of an exhibit before that exhibit is built. (Summative evaluation is the testing done after an exhibit is installed.) The advantage of evaluating formatively is that an exhibit can be improved in major or minor ways to accomplish its goals, before the large expense of construction is invested.

Our purpose in this project was two-fold: to experiment with various formative evaluation techniques and determine their usefulness, and to test the effectiveness of our exhibit texts. This report will cover the background to the project, the methods used, the results achieved, and the cost-effectiveness of the process.

BACKGROUND

As Parks Canada's major centennial project, the Cave & Basin is an ideal pilot project for formative evaluation. The project's high public visibility underlines the necessity for effective exhibits. As well, the site is complex and physically demanding, thus exhibits need to be clear and simple to permit a quick flow of people in high traffic periods.

Visitor Characteristics

The interpretive component of the Cave & Basin Centennial Centre is expected to receive over 500,000 visitors in its first year of operation. In a peak hour of a peak day, 700 people per hour are expected to arrive. A further 60,000 visitors per year will have swimming as their major goal. About 20% of the swimmers are expected to become involved in the rest of the site.

By the year 2000, up to half of the Centre visitors may arrive by bus, and these people's physical stamina and available time may be restricted. Estimates are that 20% of visitors will be children, 20 - 30% senior citizens, and 0.4% disabled (Scott Meis, Leslie Taylor - personal communication). Besides English and French visitors, the centre will receive large numbers of Germans and Japanese.

Visitors vary in many ways, including age, interests, reading ability, physical capabilities, mother tongue, the amount of time available, and size of their group. However, they are all similar in that their energy is limited - up to 1½ hour is all that is usually devoted to a site unless ample opportunity is available to sit, relax and change focus. Rest spots at the Cave & Basin will include the lounge and theatre in the Bathhouse, the teahouse, and benches throughout the site.

Project Stages

The following is a quick overview of the steps involved in our formative evaluation pilot project, with costing and staff time itemized.

A consultant, Walter Brown (one of the few experts in the field of formative evaluation), was hired on contract for the period November 1981 - March 1982, at a cost of $4,500 (funded by Socio-Economic Division, Ottawa). His final report, which is available from WRO, provided guidelines.

In April of 1982, a job description for an interpretive evaluation clerk was submitted for classification. It unfortunately was classified at CR-1. We were very lucky to have found a first year law student, Karen Wilford, willing to work for this low salary. She worked from the end of June through the end of September. Using the objectives set out in the media package, the exhibit texts written by Carolyn Johnston, and guidance from W. Brown's report, the evaluation clerk formulated questions to test the exhibit texts. Her goal was to determine whether the texts were clear and interesting, and met their assigned objectives. Other members of the interpretation team helped formulate questions, etc.

The evaluator took texts and questionnaires out to the Cave & Basin site and tested them on visitors there. After mid-September as traffic at the site decreased, the Banff Museum was used as a source of park visitors. Results were tabulated, and after a team discussion, texts or questions were revised and retesting was done. Texts from the four major exhibit areas (Lower South Belvedere, Upper Trail, Lower Trail, and Bathhouse) were tested over the summer. (Note - in late summer 1982, it was decided to relocate the proposed Bathhouse exhibits to the more spacious 2nd floor of the longhouse - however, to be consistent with the evaluator's preliminary reports, the texts for the major exhibit area are referred to here as "Bathhouse texts.)

Different members of the Cave and Basin interpretive staff helped with the evaluation project. The writer spent about four person-weeks writing the original texts and one person-week doing revisions as a result of the formative evaluation. The researcher invested at least five person-weeks of time over the summer in supervision and review, and the Interpretation chief invested about four person-weeks in hiring, supervision, and review. Each interpretation team member spent 3 two-hour periods evaluating visitors with the evaluator on-site to gain first-hand experience with the process. When the 11 weeks invested by the evaluator is added to this, the total staff time becomes 24 person-weeks, or approximately one half person-year, to evaluate all our exhibit texts. This time would be less in a project where the only concern was formative evaluation and fine-tuning of texts; part of the time investment here was devoted to evaluating the process itself.

THE METHODS

Development of Objectives

To be able to test exhibit effectiveness, clear and measurable objectives must be set. These objectives must specify quantifiable behaviour. An example of a "motherhood" objective that would be hard to quantify would be: "Visitors to the Cave & Basin will improve their knowledge of how the national parks system began." A measurable objective along these lines would be "80% of visitors who have been in the lower south belvedere will know that the discovery of the Cave & Basin hot springs led to the founding of Canada's first park." To permit evaluation, each objective of each exhibit needs a percentage attached to it. Three kinds of objectives should be set: (a) cognitive - the knowledge you want visitors to acquire; (b) affective - the attitudes and feelings you want visitors to acquire; (c) behavioural - the visitor's physical involvement and movement throughout the site. In our formative evaluation of the texts, we tested cognitive objectives only. The others will be tested when the site is closer to completion. As no other completed studies of Parks Canada interpretive facilities were available to guide our objective setting, the team based objectives on a mixture of past experience and optimism for the future. (See appendix 1 for a list of Cave & Basin cognitive objectives.) We now suspect that some of our percentages were unrealistically high and others perhaps needlessly low. Summative evaluation will test these objectives and our experiences will provide baseline data for future evaluation projects. (See appendix 2 for the Cave & Basin's evaluation strategy.)

Question Development

For many essential points on question setting, see W. Brown's report, pp. 18-30, available from the Interpretive Service, Western Regional Office. Writing

effective questions takes a fair amount of practice; our evaluation assistant's questions improved dramatically over the summer.

Questions need to be kept as concise as possible. If it takes too long to read a question, people may miss the point and answer incorrectly when they actually know the answer. We found the best number of questions per visitor was about five. If the number of objectives per text is greater than 5 it becomes necessary to split either the text or the questions. and test the different parts on different people.

To test the cognitive objectives for our exhibit texts, we used two formats. Closed format questions (for example: multiple choice) have several advantages. These questions are:

a) less threatening (than open-format questions);

b) easier to administer (quick to fill out; can be given to many visitors at once);

c) easy to correct (since it is easy to determine whether answers are right or wrong).

On the negative side, it is hard to write good questions, and multiple choice questions tend to prompt the correct answer.

Open format, or short answer questions, were done orally with one visitor at a time, quick notes being taken down by the evaluator. Their advantages include:

a) lack of prompting, or leads, to the correct answer;

b) wrong answers received can give the evaluator clues to misconceptions;

c) they allow more opportunity for creative or unexpected responses;

d) they consume less paper and transfer time, as results are tabulated as they are received.

However, they are more time-consuming for the evaluator, and harder to score - the answer given does not always indicate clearly whether or not the required knowledge was gained.

It was often a challenge to determine whether poor results on a question were the fault of the text, or the question. At first numerous rewrites were done on the questions to eliminate jargon or to simplify phrases. The multiple choice questions were difficult to set - the correct response needed to be about the same length or shorter than the others, and the alternatives couldn't be correct in any way or too similar to the correct response, while still sounding quite plausible.

Procedures

After questions were formulated and reviewed they were xeroxed in multiple copies for use on site. Texts were typed on 8" x 11" sheets in orator caps and orator lower case typeface (see examples, appendix 3). The sheets were laminated in clear plastic and attached with tape at eye level in an alcove of the Lower South Belvedere (visitors entered here to view the Cave - see site map). If more than one page of text was posted, the pages were spaced so that a small group of visitors could cluster around each. It was quickly discovered that a graphic (drawing or photograph) drew the visitors over to the texts, and that these people were then more willing to participate in the survey. The graphics used were very rough approximations of the exhibit's visuals - for example xeroxes of a drawing of a bird in a field guide, or a coloured sketch of the path of the springs water through the rock layers of Sulphur Mountain.

The evaluator, in a park uniform and with a name tag, would approach a visitor or small group of visitors as they entered the Lower South Belvedere or returned

from the Cave. She would say "Hello, my name is _____, and I'm doing a survey for Parks Canada. I was wondering if you might have five minutes to help us out?" After an affirmative response she would indicate the text and graphic. "What I have displayed here is an example of an exhibit that will be installed on this wall (for example). The photo is a rough example of the illustration we might be using. The survey I'm doing is to determine whether what is written here is clear and easy to understand. If you would read these pages and then answer a short questionnaire, it would be most helpful. Thank you." Almost invariably people would agree to participate. Any questions they had were answered immediately unless they were concerned with the text - in which case they were answered after the evaluation was completed. A volunteer from each group was requested to answer the open questions and was taken about 20 feet away and questioned in a low voice. Visitors were thanked as the questionnaires were collected and Parks Canada beaver stickers were distributed as a token of appreciation. These were well received, especially by children. The evaluation was kept as short and concise as possible for the visitors' sakes.

When results were tabulated, the number of people who chose the correct response for each question was calculated as a percentage of the total number of questionnaires completed. If that value was lower than that set in the objective, the question and text were examined for clarity. Rewritten texts or questions were tested again - the original and each change on about 20 people. Many important insights were gained from watching and listening to visitors' comments as they read texts and answered questions. Often points of confusion were more obvious from their behaviour than from their responses to the multiple choice questions. The story elements they found interesting were noted and the information used for some text revisions. For these reasons it is important that the evaluator document all right and wrong answers, comments, trends and suggestions.

In approaching visitors, it was not always possible to make contact easily, which affected the randomness of our samples. Some visitors would avoid the evaluator's eyes, head straight for the cave, or refuse to participate. A positive and cheerful attitude was essential for evaluators, and the job was easier if two people were evaluating. Karen found that mornings in the office and a period between 1 and 4 pm at the site evaluating worked best, as more visitors were present on the site in the afternoon.

Most of our evaluating was done in the Lower South Belvedere since it was sheltered from precipitation and is the access to the Cave, the destination of almost 100% of the visitors. When construction noise became impossible, (jackhammers overhead), texts were fixed to the wall or railing of the old public washrooms N.W. of the pool. This had variable success because it was dependent on the weather, and it required drawing visitors away from their intended course (to the Cave).

To test the Upper Trail texts, visitors were attracted by a sign outside the Lower South Belvedere which showed the time of the next guided tour to the upper bench. The evaluating purpose of the tour was clearly explained by the evaluator, and then the group led up through the otherwise locked fence to the cave vent, while interesting features were pointed out along the way.

The evaluating was done in the three major exhibit areas on the upper bench. Karen found that it took a few attempts to establish a smooth process. A twenty minute tour of which 5 minutes were spent on text evaluation seemed to work well.

In September the Cave and Basin road was closed, so the bathhouse texts were tested on the visitors to the Banff Museum. As this location was much less relevant to our Cave and Basin texts, we found decreases in visitors' attention and ability to focus. However, results were certainly sufficient to point to necessary text revisions. Later in the fall Carolyn used the museum to test numerous drafts of texts for the Basin main deck, viewing deck and a new vent sign. She found "judgement samples" of 6 to 10 people adequate to test her revisions.

Problems and Solutions

The main challenge, while evaluating on site, was to get willing participants. We found the graphics on the otherwise bare walls of the Lower South Belvedere were a good drawing card. Visitors were also interested in tours of the fenced upper bench area.

It would have been easier to evaluate exhibit ideas in their completed surroundings, especially if adjoining and related exhibits were already installed. In our case the whole environment had to be left to the evaluator's description and the visitor's imagination - with the added distraction of construction activity all around.

Considerable time and money constraints can be involved in getting professional mock-ups. Obviously the closer your mock-up is in appearance to the final exhibit, the more meaningful is your evaluation. Much can be learned from people's reactions to simple texts and graphics as well, luckily. While typesetting of our texts would have improved visitors' ease of reading, using an Orator typeface (large capitals) worked sufficiently well for us.

Because evaluation can be stressing and frustrating for the evaluator at times, it was found better to do a few hours every day rather than a whole morning or afternoon every other day.

Many participants in the evaluation seemed shy about handing in questionnaires and concerned about the correctness of their responses. It is important to stress at the outset that texts are being tested, not participants.

Back at the office after results were tabulated, time delays occurred occasion-

Writer from innumerable other tasks to revise the texts.

At first our tendency was to attempt to improve scores by simplifying the question rather than revising the text. This approach was soon rectified. It is very important that the writer and evaluator work closely together, and that the writer experiences visitors' reactions to the texts by evaluating occasionally on-site. Otherwise the problem of conflicts between evaluator and writer, as each protects their own creations, may arise. Our evaluator and writer had desks in the same room and this permitted frequent communications and cooperation.

It will be interesting to compare our formative evaluation results, where people read a short text, and answered questions immediately, with the amount they retain after experiencing a range of media all over the site, as will be tested in our summative evaluation in 1985.

RESULTS

Formative evaluation was very worthwhile. Many of our exhibit and trail sign texts were changed to clarify, shorten, or make them more interesting. Confusing or misleading terms were eliminated in some texts, and in others important facts were given more emphasis. Of 76 texts of varying lengths, 29 were changed in major or minor ways.

The following is an example of our evaluation results taken from our lower trail sign texts. "The Discoverers" is the final sign on this self-guiding trail.

The Discoverers: Version 1

> Over a hundred years ago, three men struggled up this slope. There was no path then. As they crested the hill, they discovered the Cave & Basin hot springs - warm waters that have changed the course of Canada's history.
>
> These waters continue to affect the lives they touch - those of plants, of animals, and of humans who are still drawn to discover the secrets of the Cave & Basin hot springs.

Objective: 50% will know that the discoverers came from this direction.

Evaluation results (from K. Wilford's Lower Trail report)

closed question: The men who discovered the Cave & Basin in 1883 approached from:

a. north, the marsh (the correct answer)

b. south, the hill

c. east, the townsite

d. west, Sundance Canyon

results:	number correct	% correct
a.	4	16.7
b.	11	45.8

c.	6	25.0
d.	3	12.5
number of people evaluated:	24	100%

These results being quite unacceptable, the text was rewritten. The discovery story was told in a slightly altered perspective, emphasizing the "following in the footsteps" theme.

The Discoverers: version 2

> You are following in the footsteps of three men who, over a hundred years ago, waded the marsh below and struggled up this slope. They carried an axe, as there was no path then. On cresting the hill, they discovered the Cave & Basin hot springs - warm waters that changed the course of Canada's history.
>
> These waters continue to affect the lives they touch - those of plants, of animals, and of the people who are still drawn to discover this birthplace of Canada's national parks.

This was tested by means of an open question:

How is the marsh connected with the discovery of the Cave & Basin?

Results:			
	Correct	5	50 (% correct)
	don't know	5	50
		10	100

Although this meets the stated objective, it appears to be confusing some people. It was mostly a case of people not comprehending the question rather than not being able to remember. Because must of the text is relevant only to the marsh itself, the location of the evaluation was moved to the area above the washrooms. From there a view of the marsh is available which, it was hoped, would make the text more meaningful.

Using the same question as above, the results were:

Correct	6	60%
Don't know	4	40

Although these results are not strikingly positive, they do meet the objective stated. While questioning people about this text, I made a point of asking if they found the text clear, easy to read, was there anything they didn't understand. It was through this general conversation that it became apparent that the text is enjoyable to read and well liked. The only comment made was about the axe - some did not seem to consider it very relevant. (See final version of text.)

The Discoverers - version 3

> You are following in the footsteps of three men who, over a hundred years ago, waded the marsh below and struggled up this slope. There was no path then. On cresting the hill, they discovered the Cave & Basin hot springs - warm waters that changed the course of Canada's history.
> These waters continue to affect the lives they touch - those of plants, of animals, and of the people who are still drawn to discover this birthplace of Canada's national parks.

For the complete evaluation results for the 4 major exhibit areas, see appendix 3.

Many public relations benefits were gained from the evaluation process. We had an opportunity to talk to many park visitors, and to provide them with information on the Centennial Centre. Many people seemed to like the idea of formative evaluation and were pleased that the government wanted their opinion, and was trying to save tax dollars.

CONCLUSIONS

Formative evaluation does not need to be costly. A summer staff person with a low classification was ample for us (at a CR - 1 level our evaluator earned $3,500). It could also be done by in-house staff as part of their normal duties. Useful results can be obtained using a simple mock-up such as a typed text and photo or hand-illustrated graphic. See W. Brown, pp. 78-80, for a quick list of steps to test your exhibit. A judgement sample of 5 - 10 people is often all that is necessary to point to crucial revisions, so revisions can be done in a short time frame.

We learned from this pilot project the importance of evaluating before final exhibit design. As a result of formative evaluation, 15 major text revisions and 14 minor text revisions were made. These changes to the texts produced an average of 18% improvement in results and comprehension. For a more complete compilation of results, see the evaluation reports for each area, appendix 3 . The total value of the exhibits that were thus changed is approximately $377,000.

Formative evaluation is thus cost-effective. Hopefully, every exhibit planning group in Parks Canada will soon be using it. The Cave and Basin interpretation staff would be glad to help you with your evaluation in any way possible (within our time constraints of opening the centre in 1985!). Don't hesitate to call.

Elisabeth Beaubien
Researcher.

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March 1983.

RELEVANT LITERATURE

1. Brown, W.S. - Evaluation Study Plan of the Cave & Basin Centennial Centre, Parks Canada Contract #C1632, April 1982 available from the Interpretive Service, Western Regional Office.

2. Cave and Basin Centennial Centre Media Package ,presented March 31, 1982 by the C & B planning team.

3. Taylor, L. - Cave and Basin Background Information Document, 1978.

ACKNOWLEDGEMENTS

Many hands contributed to this pilot project. Leslie Taylor supervised from start to finish. Karen Wilford did 90% of the evaluating and data compiling, and cheerfully braved such odds as hungry mosquitos and noisy drills on site. Carolyn Johnston wrote and rewrote to perfect her texts. Sylvia Kerenyi handled all our typing and much xeroxing.

Eric Bailey made valuable comments on texts. Steve Whittingham started the ball rolling for this pilot project in the summer of 1981. Carol Boyle reviewed a draft of this report and provided valuable suggestions. Scott Meis from Socio Economic Division in Ottawa contributed encouragement, ideas and some financing.

Last, but not least, Walter Brown produced the report that provided initial guidance in this formative evaluation project.

PRELIMINARY DISTRIBUTION LIST

- Scott Meis - Socio-Economic Division, Parks Canada, Ottawa-Hull.
- John MacFarlane - Chief of Interpretation and Extension, Western Regional Office, Calgary.
- Library - Western Regional Office, Calgary.
- Library - Banff National Park.
- Documentation Centre, Parks Canada, Ottawa-Hull.
- Cave & Basin Steering Committee - S. Kun
  J. Vollmershausen
  D. Street
  L. Pearce
  J. Raby

APPENDICES

1. Cave and Basin media objectives
2. Evaluation Strategy
3. (separately bound) - Results of text evaluations for
    a. Lower South Belvedere
    b. Upper Trail
    c. Lower Trail
    d. Bathhouse

D. COGNITIVE OBJECTIVES - by media area:

In all cases "visitor" means a person literate in English or French.

OVERALL:

Objective #

51. 90% of visitors who have been inside the buildings of the Cave & Basin complex will know that they have been at the birthplace of Canada's national parks.

52. 50% of visitors who have been inside the buildings of the complex will know that the word "Centennial" in "Centennial Centre" refers to 100 years of national parks in Canada.

LOWER SOUTH BELVEDERE:

53. 90% of the visitors who have been in the LS Belvedere and the Cave will know that the Cave contains a thermal springs.

54. 80% of the visitors who have been in the LS Belvedere will know the discovery of the Cave and Basin hot springs led to the founding of Canada's first national park.

55. 100% of the visitors who enter the LS Belvedere will be able to find the Cave.

SECOND FLOOR LONGHOUSE:

56. 70% of the visitors who pass through the longhouse will stop and look at at least one piece of exhibit material.

Of the visitors who stop at the architecture exhibit:

57. 60% will know that this building was considered a masterpiece when it was built (biggest, best, etc.)

58. 30% will know that this building was just being finished as the 1st World War broke out.

59. 30% will know that the same architect designed parts of other national landmarks.

Of the visitors who stop at the photo gallery:

60. 80% will know that the Cave and Basin has gone through several previous incarnations.

BATH HOUSE:

61. 90% of visitors who have been through the Bathhouse will know that Banff was Canada's first national park.

62. 90% will know that BNP was founded because of the hot springs.

63. 80% will know that the first reserve was established a century ago.

64. 60% will know that the attitudes toward national parks has changed over the last century.

65. 20% will know that J.B. Harkin was the father of the National Park Act and influenced the early development of national parks.

66. 60% will know that parks today attempt to balance preservation and recreation.

67. 30% will be able to describe one of the functions of a park warden.

68. 30% will be able to describe one of the functions of a park interpreter.

69. 50% will know that Parks Canada protects natural and cultural heritage.

70. 80% will know that we are trying to expand the system to cover all Canada'a natural regions and historic themes.

UPPER TRAIL SYSTEM:

71. 80% of the visitors who have been on the upper trail system and in the Cave will know that the vent is the hole at the top of the Cave.

72. 80% of the visitors who have walked the upper trail system will know that original "discoverers" used the vent to enter the cave.

73. 80% will know that the discovery of the Cave and Basin hot springs led to the founding of Canada's first national park.

74. 70% will know that the water is hot because it has been deep in the earth's crust.

75. 70% will know that the smell is caused by the sulphur in the water.

76. 40% will be able to point to an outcrop of tufa that has been pointed out for them by one of the trailside media.

77. 20% will be able to distinguish tufa from other rocks if shown samples.

78. 40% will know that tufa is deposited by the hot springs.

79. 40% will know that disputes over claims to the springs brought them to public notice.

80. 40% will know that the "discovery" was linked with railway construction.

81. 30% will know that the water stays underground for about 3 months.

82. 30% will know that the water is mildly radioactive and that this was once considered beneficial to health.

83. 50% will know that the sulphur springs were thought to have marvellous healing properties.

84. 40% will know that the water contains many minerals and some natural radioactivity.

85. 20% will know that the water was once bottled as mineral water for drinking.

LOWER TRAIL SYSTEM

86. 90% of visitors who have walked the lower trail system will know that the hot springs water changes the surrounding environment.

87. 50% will know that the discoverers came from this direction.

88. 40% will know that this is one of the few places one finds garter snakes in BNP.

89. 80% will know that the hot springs water keeps unfrozen through the winter.

90. 50% will know the Banff longnose dace lives in the outflow and is rare and endangered.

91. 50% will know that tropical aquarium fish have been released here and have survived.

92. 50% will know that the warm water keeps some plants green all winter (e.g. watercress).

93. 40% will know that the local flora includes a variety of orchid species.

94. 40% will know that a few birds which normally winter in warm southern locations choose to stay at the C & B (e.g. robin).

95. 80% will know that the area is fragile.

E. BEHAVIORAL INVOLVEMENT

Objective #

96. 50% of visitors to the Cave will feel the water.

97. 50% of visitors to the Basin main deck will feel the water.

98. 70% of visitors to the Marsh Overlook (lower trail) will use the telescopes.

99. 70% of visitors to the Bird Blind (lower trail) will look for birds or fish.

100. 70% of visitors to the Small Cave Outlet (upper trail) will use the scratch'n sniff boulder.

F. AFFECTIVE OBJECTIVES

101. People who have visited the interpretive facilities (minimum : the lower south belvedere and one other area) will show a statistically significant increase in the following attitudes:
    1. belief that parks are worth preserving;
    2. interest in visiting other exhibits and other parks;
    3. appreciation for the Cave and Basin site.

102. 100% of people who have visited an interpretive area on site will report that their experience was positive in the following ways:
    1. comfortable
    2. non-threatening
    3. worthwhile
    4. enjoyable

EVALUATION STRATEGY

Cave & Basin

The following is an update on the evaluation strategy proposed on pages 60 and 61 of the Cave & Basin media package (approved, Cave & Basin Steering Committee, 31 March 1982). It takes into account the changes that have occurred in media distribution among the various media areas of the Centennial Centre.

Objectives

An updated list of measurable objectives (which reflects the changes in media distribution and in the scope of the film and book) is appended.

Formative evaluation

As described in the media package, Dr. Walter Brown produced a report on formative evaluation techniques suitable for use at the Cave & Basin. Using this information, and other resource articles, plus advice from Scott Meis (SED), a formative evaluation programme was carried out July - September '82 by a CR-1 evaluation clerk, after Stats Can clearance.

The clerk pre-tested texts for various components of the Centre media on-site, and changes were made in those texts that proved to be misleading. Progress reports for each media area have been distributed. A summary report on the project will be drafted in February, 1983, and available in final form March 31, 1983.

A major element of the media - the orientation map to be used on signs throughout the Centre - remains to be formatively evaluated. This will be done in summer 1983. However, we will have to recruit special groups of volunteers to do this, as the site will be closed to the public throughout the coming year.

We are presently working with NFB and Credo Group (our film contractor) to develop formative evaluation for the film. Scott Meis has shown a special interest in this project.

ACCESS Alberta is formatively evaluating our edukit proposals with a "judgment sample" of 50 Alberta Grade 9 Social Studies teachers.

Summative evaluation

Staggered opening dates for various parts of the Centre will make it possible for some media to be summatively evaluated and fine-tuned prior to the formal opening (June 23, 1985). For other media, time and money have been allocated for evaluation and fine tuning after opening day. (See time-action schedules, media package pgs. 72-80).

Therefore, media along the trail systems, in the lower south belvedere, and some of the orientation media will be installed in May '84, summative evaluation carried out in the summer of '84, followed by fine-tuning and further evaluation and fine-tuning in the summer of '85. Longhouse and bathhouse exhibits will be exposed to in-house evaluation directly after installation, then fine-tuned before the June '85 opening. Summative evaluation will be carried out in July and August of '85, with further fine-tuning in the fall of that year.

Traffic flow objectives will be evaluated using the figures from the sixteen pedestrian counters which have already been ordered for the site (seven within the Centre, three between the parking lot and the Centre, and six on the self-guided trails). These counters will, of course, be ground-truthed by observation. A day of observation at each should give us appropriate conversion factors.

Stopping and holding power objectives will be evaluated by observation - one staff-day per week should be devoted to this for the first summer of operation, so that lighting and other minor on-site changes can be made as required, and information gathered for more extensive fine-tuning (requiring actual exhibit changes) in the fall.

Cognitive and affective objectives will be evaluated using the computer evaluation terminals. Demographics and multiple-choice questions based on the cognitive objectives will be administered to visitors here. Tracking questions and exhibit preferences can also be included in this evaluation medium to provide further information on the other levels of objectives. For the visitor who wishes to make more detailed comments, or who feels that the closed-format questions have not given him sufficient scope, the carrel housing the terminal will also provide "suggestion sheets" and a drop-off slot. The existence of this further level of evaluation will be emphasized on the final evaluation programme screen.

These computer terminals will be tested by W.R.O. to determine their statistical validity, and if they prove acceptable, they will be our major form of evaluation, since they will run continuously and supply by far the bulk of the data. The data they supply will also be quickly available and readily usable because the computer will do the compilation.

It would be a mistake to install the computer evaluation terminals without some method of comparing the terminal user to the general population in the longhouse. Accordingly, it will be necessary for a staff person at the site to observe the evaluation area on a regular basis for the first few weeks of operation, and on a check basis thereafter (perhaps one day/week at first, one day/month later).

The observer would count the numbers of total visitors, estimating their age and noting their sex, and the numbers of those who use the terminals, estimating the same parameters.

It has been suggested that the evaluation terminals will attract younger users disproportionately. Observations in other computerized settings indicate that male visitors will be more likely to use the terminals as well. The results of the observations would give us the opportunity to weight results from the evaluation terminals to represent the general population.

Also, if observations prove that the population using the terminals is indeed seriously skewed, then the centre staff will be notified so that they can encourage members of the under-represented groups to use the terminals. For example, suppose one of the staff is on roving duty in the Centre, and is asked a question by a woman in her 60s. If the staff member knows that this woman is part of an under-represented group, he can add to his answer: "...and when you get to the second floor, do help out by answering our little computer quiz. It helps us make the Centre even better..." Continuing observation will show whether this approach makes a difference.

Since the bathhouse A/V show will provide reinforcement for all our messages and a strong input to the affective objectives, occasional person surveys of the visitors exiting from the bathhouse theatre will be appropriate. These questions would deal mainly with the overall cognitive objectives for the Centre (#s 51 and 52) and the affective objectives.

Continuing evaluation (after year 1)

The counters at the site will continue to provide use figures for the various areas, something which has never been consistently available at the Cave & Basin.

Distribution figures for the edukit, the book, and the film will be available from ACCESS, our publishers, and the NFB respectively.

The computer evaluation terminal programmes can be continued or modified as required. Occasional observations on-site will serve to keep date updated.

Applicability to other projects

Of necessity, we picked figures from the air in setting our measurable objectives, since no final data exists on any other project to tell us what a realistic figure would be. There is no doubt that we are aiming very high in some cases.

The results from our work at the Cave & Basin, and their early availability due to the rapidity of the computer processing, will give other projects some baseline data from which to work in setting their own objectives.

Our evaluation programme will also make mercilessly clear any errors we have made in media selection, so that others can learn from our mistakes.

MEASURABLE OBJECTIVES:

These objectives were developed in consultation with Scott Meis of SED, and consultant Walter Brown. They will be used as the basis for the evaluation of media.

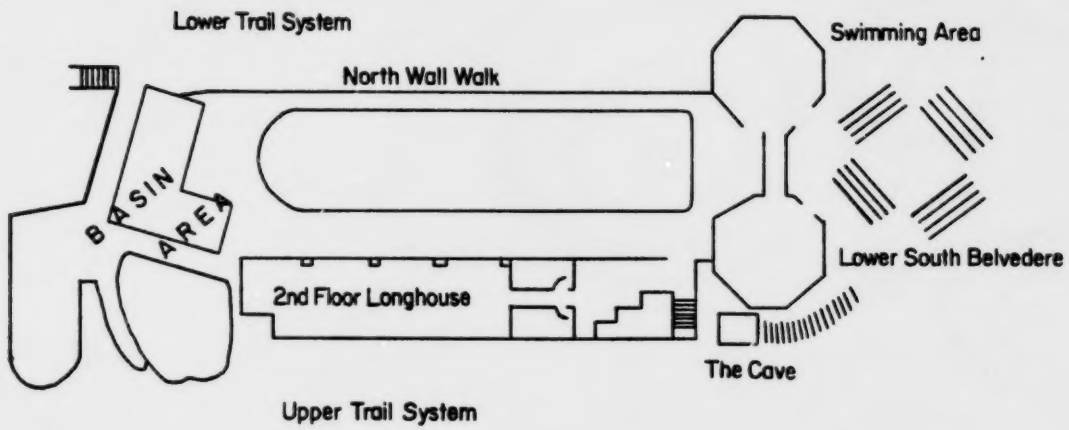
A. TRAFFIC FLOW - OVERALL

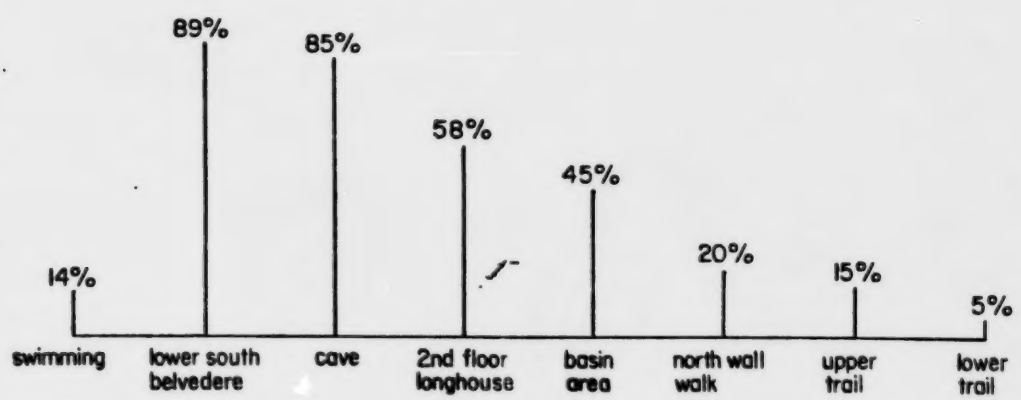
It is expected that the following percentages of all Centre visitors will reach these areas:

Objective #

1. Swimming area: 14%
2. Lower South Belvedere: 89%
3. The Cave: 85%
4. 2nd floor Longhouse: 58%
5. Basin Area: 45%
6. North Wall Walk: 20%
7. Upper Trail: 15%
8. Lower Trail: 5%

The presence of a teahouse and souvenir shop in the 1954 staff house building would greatly increase the pull toward the west end.





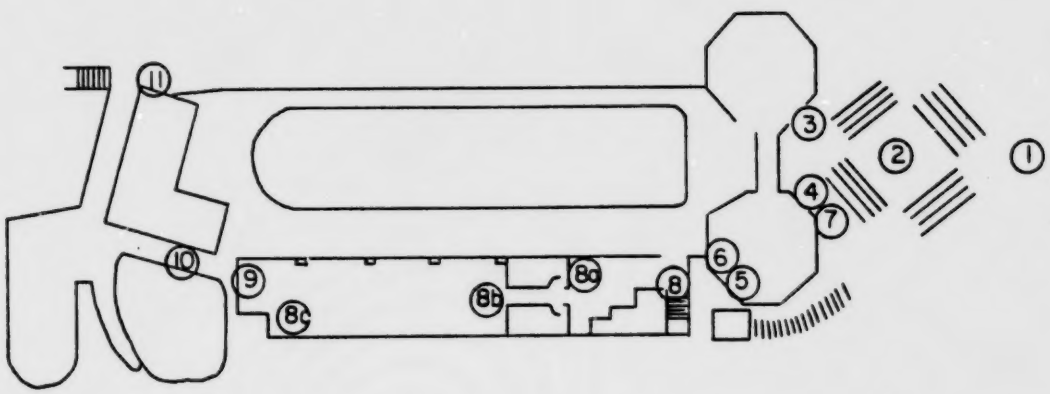
B. TRAFFIC FLOW - by decision point

Of all the people reaching each decision point labelled on the plan, it is expected that the following percentages will make the following decisions:

Objective #

9. Decision Point 1: 100% to plaza
10. DP2: 14% to swimming door, 86% to south belvedere door
11. DP3: 20% to south belvedere, 80% to parking lot
12. DP4: 100% make a left turn
13. DP5: 96% to Cave, 4% to waiting benches or back to media
14. DP6: 65% to second floor, 35% exit
15. DP7: 90% to parking lot, 10% to upper trail system
16. DP8: 90% to second floor, 10% to upper level belvederes & balcony
17. DP8A: 100% continue into second floor
18. DP8B: 15% return to south belvedere, 85% continue along 2nd floor
19. DP8C: 7% return to south belvedere, 85% continue to basin overlook
20. DP9: 95% to continue down stairs, 5% to return through longhouse
21. DP10: 93% to enter bathhouse exhibit, 7% to exit
22. DP11: 50% will head straight back to the parking lot via the north wall, 38% will use the upper trail system, 12% will use the lower trail system

For example, of all the people who reach decision point #8B (exit from washrooms), 85% will continue west through the longhouse and 15% will return to the lower south belvedere.



C. STOPPING POWER - by media piece
HOLDING POWER - by media piece

Of all the visitors passing by each of the media pieces, the following percentage will stop and look, and the holding ratio (time spent at the medium/time required to completely understand it) will be as follows for those who do stop.

Objective #	Media Area	Media Piece	Stopping Power	Holding Power Level 1	Holding Power Level
~~23~~	~~Lower South Belvedere~~	Hot Springs Model	90%	1.0	0.25
24		Discovery Mural	80%	1.0	-
25		3-faced Billboard	80%	0.8	-
26		Pamphlet Dispenser	1 per family group	1.0	-
27	2nd floor Longhouse	Architectural Model	50%	-	0.60
28		Architectural Wallpaper	5%	-	0.1
29		Photo Gallery	70%	0.8	0
30	Basin (Viewing Deck)	Railing Panels	50%	1.0	0.5
31	Basin (Main Deck)	Deck Signs	50%	1.0	0.5
32	Basin (Bathhouse)	MacDonald Train	70%	1.0	0.2
33		1st Park Collage	80%	1.0	0.2
34		A/V Show	95%	0.9	-
35		Parks Yesterday	80%	1.0	0.5
36		Parks Today	70%	1.0	0.25
37		Parks Tomorrow	80%	1.0	0.25
38		Evaluation Alcove	60%	-	0.50
39	Lower Walk	Orientation Stop	95%	1.0	-
40		Boggy Stop	80%	1.0	0.5
41		Marsh Overlook	90%	1.0	0.6
42		Bird Blind	40%	1.0	0.3
43		Slimy Stop	50%	1.0	0.7
44		Discovery	50%	1.0	-
45	Upper Walk	Basin Overlook	80%	0.9	-
46		Orientation Stop	95%	1.0	-
47		Vent Stop	95%	1.0	0.5
48		Boggy Area	70%	1.0	0.3
49		Cave Outlet	70%	1.0	0.3
50		Cave Inlet	50%	0.9	0.3

Number/
Numéro

FORMATIVE EVALUATION

CAVE AND BASIN CENTENNIAL CENTRE

SUMMER 1982

APPENDIX 3

Results of evaluation of texts, by major exhibit area

I Lower South Belvedere

II Upper Trail

III Bathhouse

IV Lower Trail

1983

LOWER SOUTH BELVEDERE

Formative Evaluation: Lower South Belvedere
Final Report

Evaluation for these texts was carried out on site in the LSB. The texts and diagrams were mounted on the wall in one of the alcoves.

1. Objective: 90% of all visitors to the LSB will know that there is a hot spring inside the Cave.

closed question (first draft): The interesting natural feature found in the Cave is

a. a tunnel
b. the Earth's crust
c. the Sulphur Mountain Fault
d. a hot spring

results:			
	a.	1	4
	b.	0	0
	c.	4	16
	d.	*20*	*80*
		25	100%

The 80% figure was considered too low for the objective and may have been a result of the wording of the question. People may have thought that a natural geological feature was the required response. The stem was altered to:
One of the following is inside the Cave:
The response choices were unchanged.

results:			
	a.	6	10.2
	b.	0	0
	c.	3	5.1
	d.	*51*	*84.7*
		60	100%

Although results were somewhat improved with this alteration, the 90% had still not been reached. It was suggested that people may not consider the Cave pool to be a "hot" spring as compared with the Upper Hot Springs.

The correct response was changed to: *d. a warm spring*

results:			
	a.	0	0
	b.	0	0
	c.	3	12
	d.	22	*88*
		25	100%

open question: What is special about the water in the Cave?

results:				
	correct -	22	(heated)	*75*
		6	(sulphur)	20
	incorrect -	1		5
		29		100%

With the open format it is more difficult to get a specific and uniform response because of a need for generality in the question. This format also requires total recall by the respondent as opposed to a triggered recall in the multiple choice format. This makes it more difficult for the respondent and again will result generally in lower correct answer percentages.

Describing the water both as heated and containing sulphur is correct, giving a 95% success rate with this question. It did appear as though some considered the question so easy that it must be a trick. The specific objective was attained by only 75% of the people.

When this is considered along with the 88% achieved in multiple choice, it may be decided that some revision of the text is necessary if these figures are not adequate.

2. objective: the heat that warms the water comes from the centre of the Earth.

closed question. The heat that warms the water originally comes from:

a. *the centre of the Earth*
b. Calgary Power
c. boilers at the Cave & Basin site
d. the tunnel leading to the Cave

Results:			
	a.	83	*95.4*
	b.	0	0
	c.	2	2.3
	d.	2	2.3
		87	100%

The simpler text would appear to be effective in conveying this information. Comments were made concerning the clarity of the diagrams used for evaluation. Any graphic problem should be remedied by the larger and more detailed permanent exhibit.

Another comment was made about an igneous instrusion in the area. This visitor, however, was off base in suggesting that the text was inaccurate.

open question: How does the water become warm?

Results:		
correct - 22	*75.9*	
incorrent - 4	13.8	
didn't know - 3	10.3	
29	100%	

76% is a fairly high percentage for this detail thus demonstrating the adequacy of the text. The advantage of the open-format question is that if the respondent does not know the answer she/he will not guess. Lack of recall may be attributed to a lack of redundancy, not to misleading information in the text.

3. objective: railway workers discovered the Cave & Basin site.

closed question: By trade, the men who are credited with the discovery of the Cave & Basin were:

a. farmers
b. hunters
c. *railway workers*
d. miners

results:			
	a.	1	1.2
	b.	2	2.4
	c.	*77*	*89.3*
	d.	6	7.1
		86	100%

open question: What job brought the "discoverers" of the Cave & Basin into the area?

results:			
	correct -	18	*62.1*
	incorrect -	5	17.2
	didn't know -	6	20.7
		29	100%

Because people are eager to hear more about the human history of the area, this fact about the discoverers was readily retained in the closed question. Many comments were made indicating a desire for more information on the men and their ventures.

4. objective: The discoverers entered the Cave through the hole in the roof of the Cave.

closed question (first draft): The first people entered the Cave through:

a. a hole in the ground
b. the present entrance
c. an abandoned mine shaft
d. an underground stream

Results:			
	a.	18	*72*
	b.	2	8
	c.	4	16
	d.	1	4
		25	100%

The low percentage of correct responses was thought to be due to confusing response choices. If people had not been to the Upper Bench, they may not realize that the hole in the roof of the Cave was set into the ground. Consequently the wording of the correct response was changed.

a. a hole in the ceiling

a.	45	*76.2*
b.	2	3.5
c.	5	8.5
d.	7	11.8
	59	100%

This percentage (76%) was still considered too low and perhaps attributable to the wording of the question. The entire question was reformulated such that no response could possibly be similar to a hole in the ceiling:

The first people entered the Cave through

a. a hole in the ceiling
b. the present entrance
c. a crack in the side of the Cave
d. an opening on the floor of the Cave.

Results:			
	a.	21	*84*
	b.	0	0
	c.	2	8
	d.	2	8
		25	100%

It is evident that the question itself was confusing to people and that once all "tricks" were eliminated the percentage of corrent responses increased.

It is suggested that this 84% level is acceptable having regard to the fact that it is not specifically written in the text.

open question: How did the first people enter the Cave?

Results:			
	correct	23	*79.3*
	incorrent	2	6.9
	didn't know	4	13.8
		29	100%

Although this correct rate appears higher, the most common response was "down a tree trunk ladder". This is not the specific answer that was expected, albeit correct. It appears that this rather interesting fact is retained more reaily. The people are obviously understanding the text and the picture.

5. objective: through ownership disputes the hot springs came to the attention of the federal government.

closed question: The federal government became aware of the hotsprings through:

a. the discovery of the Cave itself
b. arguments over who owned the hot springs
c. the discovery of the sulphurous mists
d. a visit to the site by Sir John A. Macdonald.

results:			
	a.	21	24.1
	b.	59	*67.9*
	c.	7	8.0
	d.	0	0
		87	100.0%

open question: How did the hot springs come to the attention of the federal government?

results:			
	correct	18	*62.1*
	incorrect	4	13.8
	didn't know	7	24.1
		29	100%

This objective had no numerical value attached to it and may be considered as detail information. It is suggested that the low percentages are acceptable, as more emphasis on this fact may result in decreased retention of a more important fact. This information will be reinforced in other media on-site. Redundancy should lead to better retention.

6. objective: In response to ownership disputes, the federal government set aside a reserve around the hot springs.

closed question: In response to ownership disputes, in 1885 the federal government

a. set up the Cave & Basin Centennial Centre
b. laid out the town of Banff
c. began bottling mineral water from the hot springs
d. established a reserve around the hot springs

results:			
	a.	9	36
	b.	0	0
	c.	0	0
	d.	*16*	*64*
		25	100%

This percentage (64%) was considered much too low for what is a major fact to be presented. The correct answer was altered to make it more clear and detailed.

d. established a reserve which later became a national park.

results:			
	a.	5	8.2
	b.	0	0
	c.	0	0
	d.	*56*	*91.8*
		61	100%

This slight correction was all that was needed to demonstrate that the text was effective. This emphasizes the need in evaluation not to be tricky. It was obvious that the information was being learned, once a specific enough answer was provided.

open question: After the area had come to national attention, what step was taken by the federal government.

results:			
	correct	25	*86.2*
	incorrect	0	0
	didn't know	4	13.8
		29	100%

This is a fairly high percentage for an open format question, underlining the effectiveness of the text. People were pleased with the wording, i.e. "set aside for all Canadians". This is most likely because of the implied personal touch.

7. objective: 80% of all people who visit the area will know that the Cave & Basin site is the birthplace of Canada's national park system.

closed question: The national significance of the Cave & Basin site is

a. an important miracle cure centre
b. the beginning of national hot springs
c. the birthplace of Canada's national parks
d. Canada's most popular cave.

results:			
	a.	1	1.1
	b.	10	11.5
	c.	73	*84.0*
	d.	3	3.4
		87	100%

As this is a central fact it was appropriate to ensure that learning was taking place. The question was rephrased as follows:

Where did national parks in Canada begin?

a. Mount Rundle
b. Roger's Pass
c. Cave & Basin hot springs
d. Bow River

results:	a.	0	0
	b.	0	0
	c.	*23*	*92*
	d.	2	8
		25	100%

It appears that this information is being properly imparted and retained.

closed question: What is the national historical significance of the Cave & Basin site today?

results:	correct	15	*51.8*
	incorrect	4	13.8
	didn't know	10	34.4
		29	100%

This particular question was not at all successful. The results seem to reflect the fact that people found it vague and academic-sounding. Because of the success of the closed question, the open question was not reformulated.

8. objective: 50% of all visitors will know that the Centre is commemorating 100 years of national parks in Canada.

closed question: We have had national parks in Canada for almost

a. 120 years
b. 100 years
c. 80 years
d. 60 years

results	a.	6	7.0
	b.	76	*88.4*
	c.	2	2.3
	d.	2	2.3
		86	100%

open question: Approximately how long have we had national parks in Canada?

results	correct	25	*86.3*
	incorrect	1	3.5
	didn't know	3	10.2
		29	100%

These results clearly show that the 'centennial' concept is being retained by those visiting the site. This may be partly as a result of the sign that is on site. However, 1985 visitors will also have had more media exposure than only that which is presented in the LSB.

9. objective: The hot springs water travels 2 km down into the Earth's crust.

closed question: The water from the hot springs has already travelled

a. to the Earth's core
b. about 2 km down
c. about 20 km down
d. about 200 km down

results	a.	10	16.7
	b.	38	*63.3*
	c.	5	8.3
	d.	7	11.7
		60	100%

The main goal with this question was that people did not think that the water went to the very centre of the Earth. Although some people were unable to recall the exact distance, they were on the right track.

Scaled Questions

These had debatable validity. It appears as though something must be extreme before a negative or even neutral response is evoked. The texts we are dealing with are not so controversial or extreme as to result in this and consequently the texts rated about 4 on scales of easy, clear, and interesting.

Notable Comments

People left wanting more information such as background on the discoverers, details on the ownership dispute, current temperatures and fluctuations, mineral content, and old photos.

There was some concern that the "Earth's core" diagram be clearly and colourfully laid out. The simple style of the text was praised as very practical and enjoyable to read. There was one suggestion to change snow-melt to melted snow.

JOURNEY INTO THE EARTH

HEAT FROM THE MOLTEN CENTRE OF THE EARTH WARMS THE HOT SPRINGS WATER

Heat from our planet's fiery core radiates outward to the earth's crust. Water from rain and snow-melt filters down more than 2 km through the other side of this mountain, and taps this warmth. Forced up along the Sulphur Mtn. fault (or fracture), the water surfaces as the Cave & Basin hot springs.

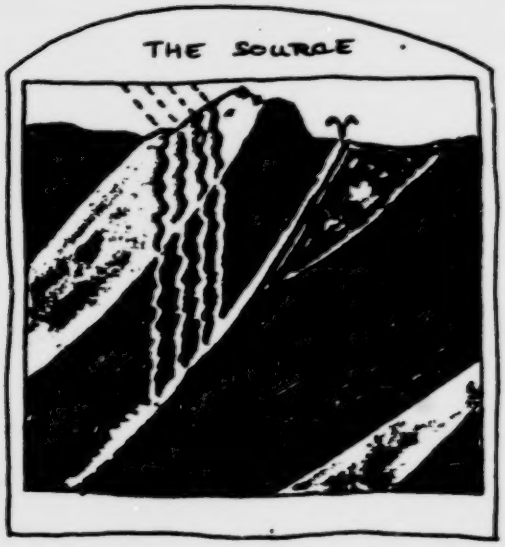
To see the Cave hot spring enter the tunnel behind you.

JOURNEY INTO THE EARTH (Version 2 - considered more difficult - not used)

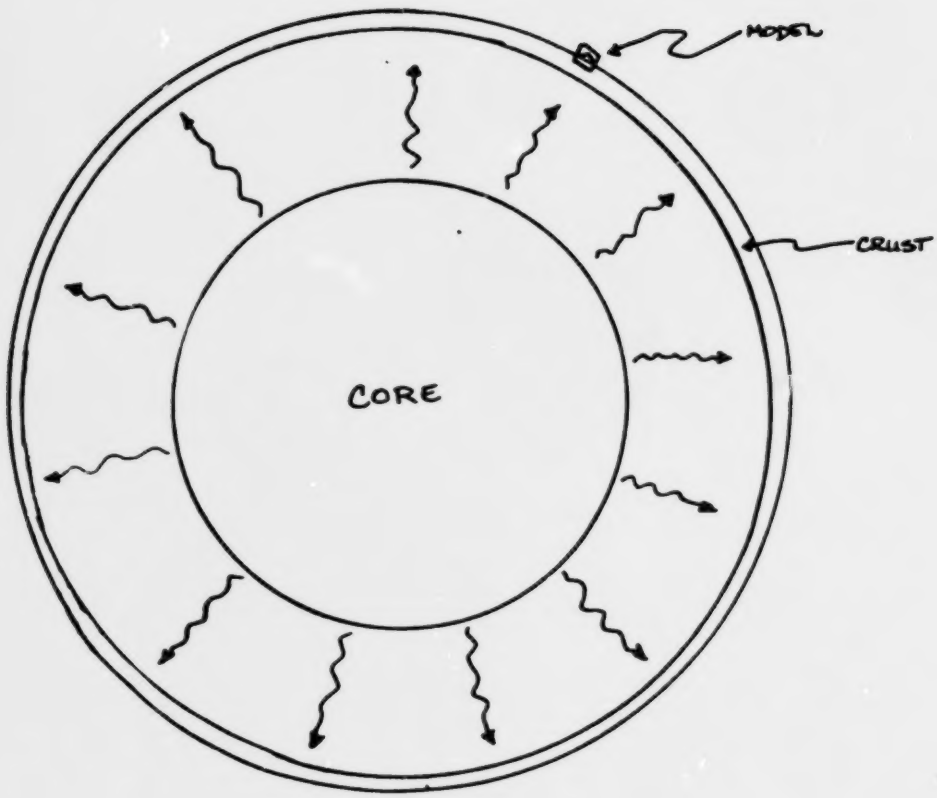
HEAT FROM THE EARTH'S MOLTEN INTERIOR WARMS THE HOT SPRINGS WATER.

THE HEAT FROM THE MOLTEN CORE OF THE EARTH IS SO INTENSE THAT IT RADIATES OUTWARD TO THE EARTH'S VERY CRUST. THOUGH IT FILTERS DOWN A SCANT 2 KM THROUGH THE OTHER SIDE OF THIS MOUNTAIN, WATER FROM RAIN AND SNOW-MELT TAPS THIS WARMTH. FORCED UP ALONG THE SULPHUR MTN. FAULT (OR FRACTURE), THE WATER SURFACES AS THE CAVE & BASIN HOT SPRINGS.

TO SEE THE CAVE HOT SPRING ENTER THE TUNNEL BEHIND YOU.



MODEL


MODEL
CRUST
CORE

DISCOVERY

CANADA'S NATIONAL PARKS WERE BORN ON THIS SPOT

It was 1883. Fearfully, three railway workers descended a tree-trunk ladder through sulphurous mists to find the Cave hot spring.

Their ownership claims brought these springs to the attention of the nation.

IT ALL STARTED HERE

FACE 1: 1885

DISPUTES OVER OWNERSHIP OF THE CAVE & BASIN HOT SPRINGS PROMPTED THE FEDERAL GOVERNMENT TO RESERVE THIS AREA FOR ALL CANADIANS.

FACE 2: 1985

THE CAVE & BASIN CENTENNIAL CENTRE COMMEMORATES 100 YEARS OF NATIONAL PARKS.

FACE 3: 1885 - 1985

CANADA'S NATIONAL PARKS STARTED HERE -- NOW THEY SPAN THE COUNTRY.

Cave & Basin Centennial Project

Questionnaire for Evaluation of Proposed Texts (first draft):

LOWER SOUTH BELVEDERE

This questionnaire is not a test of your ability, but our effectiveness in presenting the information. Thank you for your help and cooperation in enabling the Cave & Basin Project to make the 1985 Centennial a greater success.

After reading the indicated texts, please circle the best answer to the following questions.

1. The interesting natural feature found in the Cave is:
   a. a tunnel
   b. the Earth's crust
   c. the Sulphur Mountain Fault
   d. a hot spring

2. The heat that warms the water originally comes from:
   a. the centre of the Earth
   b. Calgary Power
   c. boilers at the Cave & Basin site
   d. the tunnel leading to the Cave.

3. By trade, the men who are credited with the discovery of the Cave & Basin were:
   a. farmers
   b. hunters
   c. railway workers
   d. miners

4. The first people entered the Cave through:
   a. a hole in the ground
   b. the present entrance
   c. an abandoned mine shaft
   d. an underground stream

5. The federal government became aware of the hot springs through:
   a. the discovery of the Cave itself
   b. arguments over who owned the hot springs
   c. the discovery of sulphurous mists
   d. a visit to the site by Sir John A. Macdonald

6. In response to ownership disputes, in 1885, the federal government:
   a. set up the Cave & Basin Centennial Centre
   b. laid out the town of Banff
   c. began bottling mineral water from the hot springs
   d. established a reserve around the hot springs

7. The national significance of the Cave & Basin site is:
   a. an important miracle cure centre
   b. the beginning of national hot springs
   c. the birthplace of Canada's national parks
   d. Canada's most popular cave

8. We have had national parks in Canada for almost:
   a. 120 years
   b. 100 years
   c. 80 years
   d. 60 years

Cave & Basin Centennial Project

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After reading the indicated texts, please circle the best answer to the following questions.

1. One of the following is inside the cave:
   a. a tunnel
   b. the Earth's crust
   c. the Sulphur Mountain Fault
   d. a hot spring

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   a. the centre of the Earth
   b. Calgary Power
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   a. farmers
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   c. the birthplace of Canada's national parks
   d. Canada's most popular cave

8. We have had national parks in Canada for almost:
   a. 120 years
   b. 100 years
   c. 80 years
   d. 60 years

9, The water from the hot springs has already travelled

a. to the Earth's centre
b. about 2 km down
c. about 20 km down
d. about 200 km down

General rating for all texts: please circle the appropriate response.

1. Are these texts easy to read?

EASY				DIFFICULT
5	4	3	2	1

2. Are these texts confusing or unclear as to their meaning?

CLEAR				CONFUSING
5	4	3	2	1

3. Are these texts interesting?

INTERESTING				BORING
5	4	3	2	1

4. Are there any words or phrases that you did not understand?

_____

_____

5. Please state any additional comments you may have concerning the overall effectiveness of the texts.

_____

_____

_____

_____

TB/CT - Reg,
B6098 - 2

Cave & Basin Centennial Project
Evaluation of Proposed Texts for Lower South Belvedere

1. Which of the following is found in the Cave?

    a. a tunnel
    b. the Earth's crust
    c. the Sulphur Mountain Fault
    d. a warm spring

2. The first people entered the Cave through

    a. a hole in the ceiling
    b. the present entrance
    c. a crack in the side of the Cave
    d. an opening on the floor of the Cave

3. Where did national parks in Canada begin?

    a. Mount Rundle
    b. Roger's Pass
    c. Cave & Basin hotsprings
    d. Bow River

TB/CT - Reg. 1
B6098 - 2

Cave & Basin Centennial Project

Open-Format Questions for Evaluation of Proposed Texts

LOWER SOUTH BELVEDERE

COPY TO EVALUATOR ONLY

1. What is special about the water in the Cave?
   - hot springs, thermal pool, warm water
   - other _____

2. How does the water become warm?
   - deep in Earth's crust, heat from Earth's core
   - other _____

3. What job brought the "discoverers" of the Cave & Basin into this area?
   - railway construction, CPR transcontinental
   - other _____

4. How did the first people enter the Cave?
   - through the Vent, from above, through a hole in the ground
   - other _____

5. How did the hot springs come to the attention of the federal government?
   - conflicting claims, ownership disputes
   - other _____

6. After the area had come to national attention, what step was taken by the federal government?
   - reserve around the springs
   - other _____

7. What is the national historical significance of the Cave & Basin site today?
   - beginning of national parks, Canada's first national park
   - other _____

8. Approximately how long have we had national parks in Canada?
   - about 100 years
   - other _____

Demographic Information

Age	0 - 25	25 - 50	50+	
Gender	M	F		
Language	Eng.	Fr.	Other	
Social Unit	Family	Couple	Peer Group	Alone

TB/CT - Reg,

B6098 - 2

UPPER TRAIL

Formative Evaluation of Upper Trail Texts

Introduction

The procedure for closed question evaluation of these texts involved collecting a group of volunteers and taking them to the Upper Bench. It was felt that a more accurate evaluation could take place if the texts were read in context. A sign announcing a short guided tour at specified times was placed at the locked gate just ouside the Lower South Belvedere. Before the tour began, its purpose was clearly explained so that people understood our main goal to be completion of a survey. It was found to be difficult to test the complete text with one group of people. Consequently, the texts were divided into three testing areas: BASIN OVERLOOK and VENT AREA; BOGGY AREA; and CAVE OUTLET and CAVE INLET. The approximate time for each tour was ½ hour, during which the upper belvederes, the roof area, the Vent, the archaeological site, and the Cave Outlet were pointed out. Various structural and historical facts were mentioned while avoiding any information that was to be tested in the questionnaire.

The open format evaluation was done at a later date when the Upper Bench was under construction. No type of guided tour was feasible at this point. Instead, texts were placed in the alcoves of the Lower South Belvedere with appropriate photos. Although generally successful, some problems with context were encountered. These will be dealt with in the body of the report.

BASIN OVERLOOK

1. objective: visitors will know that the Basin was discovered by railway workers in the 1880's.

closed: when and by whom was the Basin discovered?

a. 1860's, prospectors
b. 1870's, government employees
c. 1880's, railway workers
d. 1890's, surveyors

results:			
a.	2	8
b.	0	0
c.	*23*	*92*
d.	0	0
	25	100%

open: Approximately when did the railways workers discover the Cave & Basin?

results:			
correct	*18*	*90*
incorrect	1	5
don't know	1	5
	20	100%

Although the objective was being met, a problem was nevertheless detected. On observing the people who were filling out the questionnaires, it was apparent that there was some confusion caused by the use of both terms "prospectors" and "railway workers". The correct answer was often achieved by comparison of the dates alone. In response to this ambiguity, the text was altered slightly. The prospecting idea was maintained, but was less emphasized by not actually calling the men prospectors. This small change was not retested.

2. Because the text combines certain amounts of information, sometimes more than one objective is being dealt with. The following closed question is just such a case of overlap.

objectives: 80% will know that discovery of the Cave and Basin led to the founding of Canada's national parks.
: 40% will know that ownership disputes brought the springs to public notice.

closed: The final result of ownership disputes over and government interest in the hot springs was:

a. the closing down of the site
b. the founding of Canada's national park system
c. a famous court case
d. many people overlooking the Basin.

results:			
	a.	0	0
	b.	*23*	*92*
	c.	1	4
	d.	1	4
		25	100%

The open question tested only one objective. Because a specific response is desired, the open format question must ask only one thing.

The objective chosen was: 80% will know that discovery of the Cave & Basin led to the founding of Canada's national parks.

open: Why is this site important to national parks?

results:			
	correct	*15*	*75*
	incorrect	5	25
		20	100%

Of the incorrect responses, 3 thought the site was important because of the hot springs, and 2 because it is a tourist attraction. Both answers are at least partially true. Another response given, one marked correct, was that the Cave & Basin is the heritage of national parks in Canada.

VENT AREA

3. objective: 80% of the visitors to the Upper Trail will know that the Vent is the top of the Cave.

closed: Below this vent, or hole, lies
a. the marsh
b. the Centennial Centre
c. the Basin
d. *the Cave*

results:			
	a.	0	0
	b.	0	0
	c.	5	20
	d.	*20*	*80*
		25	100%

An important realization to come out of this question was that many visitors think that the pool in the Cave is the Basin. It is desirable that people should know that there are two separate springs before they actually come into contact with exhibits. It was decided that orientation media emphasizing that there are two springs would be the best approach. Rewriting the text is not justified to overcome a problem which is most likely due to the closing down of the site and the chaos of the current construction.

When dealing with the open format questions, it became clear that this objective could only make sense in context. The open question developed earlier with the intention of being done at the vent area, made no sense in the Lower South Belvedere. As #5 dealt with how the discoverers got into the Cave (which is related to the present objective), this open questi was set aside.

4. objective: 40% will know that the "discovery" was linked with railway construction.

closed: The discovery of the Cave & Basin was linked with that historical event?

a. Canada's centennial
b. *construction of the railway*
c. invention of the automobile
d. discovery of oil on the prairies

results:			
	a.	2	8
	b.	*22*	*88*
	c.	0	0
	d.	1	4
		25	100%

open: What major construction job was closely related to the discovery of the Cave & Basin hot springs?

results:			
	correct	*16*	*80*
	incorrect	2	10
	don't know	2	10
		20	100%

5. objective: 80% of all visitors will know that the original discoverers used the Vent to enter the Cave.

closed: The Cave was reached through:

a. the present entrance
b. the Basin
c. *the opening at the top of the Cave.*
d. the Sulphur Mountain Fault

results:			
	a.	3	12
	b.	1	4
	c.	*21*	*84*
	d.	0	0
		25	100%

open: How did the first people get into the Cave?

results:			
	correct	*15*	*75*
	incorrect	3	15
	don't know	2	10
		20	100%

As with the Lower South Belvedere results, people quite often replied "down a tree trunk ladder" to this question. One response that was marked incorrect gave all information about the discovery of the Cave except that the men went through the hole in the ground. Perhaps the respondant did not understand the question. In any case it is clear that people are reading and understanding the text.

6. objective: visitors will know that there is a thermal pool inside the Cave.

closed: Inside the Cave there is:
a. *a thermal pool*
b. the Basin
c. the marsh
d. a mine

results:			
	a.	*17*	*68*
	b.	8	32
	c.	0	0
	d.	0	0
		25	100%

These results underline the Cave/Basin difficulty which was mentioned in #3. Once this issue is clarified through orientation media, the problem should be eliminated. "Thermal" is a term which may not be familiar in this context.

open: What is special about the water in the Cave?

results:			
	correct	*18*	*90*
	incorrect	2	10
		20	100%

Many people stated that the water is special not only because of the warm springs but also because of high sulphur and mineral content.

7. objective: 40% will know that disputes over claims to the springs brought them to public notice.

closed: The federal government created a park reserve in response to:
a. wildlife being endangered
b. conflicts with the railway
c. disputes with Native Peoples
d. *disputes over who owned the hot springs.*

results:			
	a.	1	4
	b.	0	0
	c.	0	0
	d.	*24*	*96*
		25	100%

open: What did the federal government do in response to ownership disputes over the hot springs?

results:			
	correct	*17*	*85*
	incorrect	1	5
	don't know	2	10
		20	100%

Some very interesting comments were made in response to this open format question. General sentiment toward the federal government was not at all favourable. People see the creation of the reserve in 1885 as another example of the government taking advantage of the ordinary man. Many were aware of the settlement that McCabe and McCardell received but still thought that the government pulled a "smart move". Although many of the replies were accurate there was a definite slant to the perspective taken by most. This attitude should be checked again in summative evaluation to see if it has changed with the aesthetic aspects of the site.

8. objective: 80% will know that the discovery of the Cave & Basin led to the founding of Canada's first national park.

closed: By 1887, the discovery of the Cave & Basin had led to:

a. the construction of the CP railway
b. wildlife sanctuaries throughout the area
c. *the establishment of Canada's first national park*
d. the establishment of hot springs across Canada.

results:			
	a.	0	0
	b.	0	0
	c.	*24*	*96*
	d.	1	4
		25	100%

This objective was tested twice by closed questions; see #2 for a slightly different focus. Because it is more difficult to hold people's attention with open format questions (i.e. it takes longer, more effort), it was decided not to test this objective a second time. The goals of formative evaluation involve not annoying the visitor; it is better that s/he feel that the government was helped, not that s/he was bothered. An underlying goal is to keep questions as "short and sweet" as possible.

CAVE OUTLET

9. objective: 70% will know that the water is hot because it has been deep in the Earth's crust.

closed: The water of the hot springs is heated

a. *deep in the Earth's crust*
b. as soon as it reaches the surface
c. in the Cave
d. in the Basin

results:			
	a.	*27*	*93.1*
	b.	2	6.9
	c.	0	0
	d.	0	0
		29	100%

open: How does the water of the springs become warm?

results:			
	correct	*14*	*60*
	incorrect	5	25
	don't know	1	5
		20	100%

Of the incorrect answers, 4 stated that the water went down to the centre of the Earth. Some people are not understanding the text but the percentage is perhaps not large enough to warrant a change of text. More explicit graphics may be helpful with the final exhibit. The diagram used in evaluation was perhaps not as explicit as those used for the Lower South Belvedere, giving lower results. The somewhat higher results achieved with the LSB texts may indicate a more effective text and may be used as a basis if some alteration is deemed necessary.

10. objective: 30% will know that the water stays underground for about 3 months.

This media package objective was cancelled. We have no exact information on this issue and therefore cannot state it as fact. Because we don't have conclusive enough data, some type of study is needed. Perhaps someone doing a doctorate or thesis will choose this as an area of study, thus providing us with more concrete facts.

11. objective: 40% will know that the water contains minerals and some natural radioactivity.

closed: Which of the following is picked up by the water in its underground journey?

a. electricity
b. *radioactivity*
c. pollution
d. different species of fish

results:			
	a.	0	0
	b.	*29*	*100*
	c.	0	0
	d.	0	0
		29	100%

open: How does the water change after being underground?

results:			
	correct - (both minerals and radioactivity)	*8*	*40*
	(minerals only)	*11*	*55*
	don't know	1	5
		20	100%

Information gain is within the limits set for this area. This particular objective in the media package is somewhat overlapped with another. 30% will know that the water is mildly radioactive and that this was once considered beneficial to health. Although worth noting, this overlap is of no great concern as the results achieved in evaluation meet both objectives. People were also noting that the radioacticity is only slight; this is valuable as we do not want people to think that their health is endangered in any way.

12. Objective: visitors will know that the minerals and slight radioactivity are acquired mainly from underground rocks.

closed: The minerals and slight radioactivity of the water are acquired mainly:

a. from rain and snow-melt
b. *from underground rocks*
c. after resurfacing
d. after being added by Parks Canada

results:			
	a.	4	13.8
	b.	*25*	*86.2*
	c.	0	0
	d.	0	0
		29	100%

open: How does the water of the hot springs acquire minerals and radioactivity?

results:			
	correct	*15*	*75*
	don't know	5	25
		20	100%

13. objective: visitors will know that the springs water originally comes from rain and snow-melt.

closed: The water in the hot springs originally comes from:

a. *rain and snow-melt*
b. underground rocks
c. the Earth's molten core
d. the marsh

results:			
	a.	*25*	*86.2*
	b.	3	10.4
	c.	1	3.4
	d.	0	0
		29	100%

open: Where does the water of the springs originally come from?

results:			
	correct	*16*	*80*
	incorrect	1	5
	don't know	3	15
		20	100%

BOGGY AREA

14. objective: 70% will know that the smell is caused by sulphur in the water.

closed: The smell of the water is caused by:

a. potassium
b. calcium carbonate
c. magnesium
d. *sulphur*

results:			
	a.	0	0
	b.	0	0
	c.	0	0
	d.	*20*	*100*
		20	100%

open: What causes the water to smell the way it does?

results:			
	correct	*20*	*100*
		20	100%

The high success rate with this question may be partly attributed to common knowledge that hot springs contain sulphur. Regardless, the success of the text is apparent and the objective is being met.

15. objective: 50% will know that the springs were supposed to have marvellous healing properties.

closed: One quality which attracted many visitors in the early days w

a. cool temperatures
b. heavy growth of algae
c. supposed healing properties
d. high buoyancy

results:			
	a.	0	0
	b.	0	0
	c.	*20*	*100*
	d.	0	0
		20	100%

The open format question for this objective was combined with that for #16 as the desired responses for both were the same:

open: What beneficial quality was the water and the slight radio-activity reputed to have for people?

results:			
	correct	*15*	*75*
	don't know	5	25
		20	100%

16. objective: 30% will know that the slight radioactivity was thought to be beneficial to health.

closed: About 70 years ago, the slight radioactivity was thought to:

a. generate electricity
b. be beneficial to health
c. heat the water
d. mutate the plant life

results:			
	a.	0	0
	b.	*18*	*90*
	c.	2	10
	d.	0	0
		20	100%

17. objective: 20% will know that the hot springs water was once bottled for drinking.

closed: About 100 years ago, the hot springs water was also used for:

a. producing steam for power
b. mixing mortar for buildings
c. growing tropical plants
d. bottled drinking water

results:			
	a.	0	0
	b.	1	5
	c.	0	0
	d.	*19*	*95*
		20	100%

open: About 100 years ago, how did people use the water other than for bathing?

results:			
	correct	*15*	*75*
	incorrect	1	5
	don't know	4	20
		20	100%

This particular section of text was very well received. People enjoyed reading and learning things that are of general interest.

CAVE INLET

The closed questions for this section were presented together with those of the Cave Outlet. As a result of comments and attitudes observed during the "guided walk", the text was revised so as to make the tufa concept more interesting and relevant to the visitors. As well as straight geological facts, the impact of tufa on the site was integrated into the text.

The open format questions testing this revised text, were separated into smaller units; the only text read was that for the Cave Inlet. This should be considered, as well as the use of the revised text, when comparing closed and open results.

18. objective: visitors will know that minerals contained in the water ar deposited when the springs come to the surface.

closed: When the hot springs water surfaces, some minerals:

a. *are deposited over the surrounding area*
b. are dissipated and no longer present
c. change form and become highly valuable
d. create heavy mists

results:			
	a.	*22*	*88*
	b.	2	8
	c.	0	0
	d.	0	0
no response		1	4
		25	100%

open: What is deposited by the water when it surfaces?

results:			
	correct	*17*	*85*
	don't know	3	15
		20	100%

The large majority of respondents to the open question replied specifically calcium carbonate, as opposed to minerals generally. This demonstrates that the text is conveying the information well; people learned even the small details.

19. objective: 40% will know that tufa is deposited by the hot springs.

closed: The minerals deposited by the hot springs harden to form a type of rock called

a. limestone
b. granite
c. *tufa*
d. quartz

results:			
	a.	5	20
	b.	0	0
	c.	*20*	*80*
	d.	0	0
		25	100%

open: What is the rock called that is formed by hardened minerals?

results:			
	correct	*19*	*95*
	incorrect	1	5
		20	100%

Here the higher percentage seen in the open question may be a result of a shorter and more interesting text. In any case, the text is effective and clearly meets the stated objective.

20. objective: 20% will be able to distinguish tufa from other rock if shown samples.

This objective was tested by setting out four samples of rock in the following order: quartz sandstone, limestone, tufa, and shale. Visitors were asked to indicate which sample was tufa.

results:			
	correct	18	90
	incorrect	2	10
		20	100%

One incorrect response was the result of one person not seeing the small comparison samples of limestone and tufa accompanying the text. Thereafter it was ensured that everyone had observed the two rocks side by side beneath the text.

The objective in the media package requiring people to point to an outcropping of tufa was held to be too easy, since almost all surrounding rock is tufa. Thus it was not tested. The percentage of people correctly distinguishing tufa was more than adequate. A common comment was that the type of rock shown was that which forms the inside of the Cave. People applied what they had learned to another aspect of their visit to the site.

One suggestion made for this section of text concerned the pronunciation of tufa. Clariying this problem would be most helpful. For example it is suggested that at the first mention of tufa a pronunciation such as (too-fa) can be given. This alteration has been made.

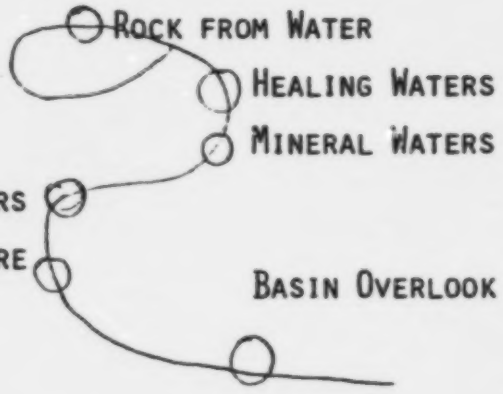
1. Basin Overlook

In 1883, three railway workers discovered the pool below and christened it the Basin. Their ownership claims aroused government interest and led to the founding of Canada's first national park.

11. Orientation Stop

Here run magic waters - waters to make money, heal disease, create rock. This short self-guiding trail tells you more.

Map:



111. VENT AREA

(INTRODUCTORY SIGN)

MONEYED WATERS

THIS HOLE IN THE GROUND LEADS TO THE CAVE HOT SPRING. HERE, AN IDEA TOOK ROOT. IT WAS A PLAN TO MAKE MONEY, BUT IT GREW INSTEAD INTO CANADA'S NATIONAL PARK SYSTEM.

This story continues on the railing signs beside you.

(RAILING SIGNS)

1. 1883 - OUT TO MAKE THEIR FORTUNES, THREE PROSPECTORS EXPLORED THIS VALLEY. WORK ON THE FIRST TRANSPORTATION ROUTE ACROSS CANADA, THE CANADIAN PACIFIC RAILWAY, HAD BROUGHT THEM TO THIS WILDERNESS.

   JUST BELOW HERE THEY STUMBLED UPON A WARM STREAM. FOLLOWING IT UPHILL, THEY FOUND THE BASIN POOL, CHOKED WITH LOGS, AND THIS MYSTERIOUS HOLE IN THE GROUND . . .

2. continued . . .

   HESITANTLY, WILLIAM MCCARDELL INCHED DOWN THIS HOLE ON A TREE-TRUNK LADDER. HIS BROTHER TOM AND PARTNER FRANK MCCABE WAITED ABOVE.

   DOWN AMONG THE EERIE SULPHUROUS MISTS, HE FOUND A CAVE OF HANGING STALACTITES AND A CLEAR WARM SPRING WELLING UP FROM BELOW. HE STRIPPED AND SWAM IN THE POOL.

   THEIR PROSPECTING, HE REALIZED, HAD UNEARTHED A MINE OF A DIFFERENT SORT . . .

Version II

111. VENT AREA

(INTRODUCTORY SIGN)

MONEYED WATERS

THIS HOLE IN THE GROUND LEADS TO THE CAVE HOT SPRING. HERE, AN IDEA TOOK ROOT. IT WAS A PLAN TO MAKE MONEY, BUT IT GREW INSTEAD INTO CANADA'S NATIONAL PARK SYSTEM.

This story continues on the railing signs beside you.

(RAILING SIGNS)

1. 1883 - OUT TO MAKE THEIR FORTUNES, THREE YOUNG MEN PROSPECTED THIS VALLEY. WORK ON THE FIRST TRANSPORTATION ROUTE ACROSS CANADA, THE CANADIAN PACIFIC RAILWAY, HAD BROUGHT THEM TO THIS WILDERNESS.

   JUST BELOW HERE THEY STUMBLED UPON A WARM STREAM. FOLLOWING IT UPHILL, THEY FOUND THE BASIN POOL, CHOKED WITH LOGS, AND THIS MYSTERIOUS HOLE IN THE GROUND . . .

2. continued . . .

   HESITANTLY, WILLIAM MCCARDELL INCHED DOWN THIS HOLE ON A TREE-TRUNK LADDER. HIS BROTHER TOM AND PARTNER FRANK MCCABE WAITED ABOVE.

   DOWN AMONG THE EERIE SULPHUROUS MISTS, HE FOUND A CAVE OF HANGING STALACTITES AND A CLEAR WARM SPRING WELLING UP FROM BELOW. HE STRIPPED AND SWAM IN THE POOL.

   THEIR PROSPECTING, HE REALIZED, HAD UNEARTHED A MINE OF A DIFFERENT SORT . . .

3. continued . . .

. IN A FRONTIER WHERE PLUMBING IS UNKNOWN, HOT WATER CAN BE LIQUID GOLD. THIS SCENT OF SULPHUR COULD BE TURNED INTO THE SMELL OF MONEY IF THE THREE MEN COULD GAIN LEGAL TITLE TO THE SPRINGS.

BECAUSE THIS LAND DIDN'T FIT EXISTING CATEGORIES OF MINING OR AGRICULTURAL LAND, THE GOVERNMENT COULDN'T GRANT OWNERSHIP RIGHTS.

SOON FIVE OTHER MEN SMELLED MONEY; THEY TOO CLAIMED OWNERSHIP . .

4. continued . . .

OWNERSHIP DISPUTES OVER THE HOT SPRINGS BROUGHT THE FEDERAL GOVERNMENT INTO THE FRAY. IN 1885, PARLIAMENT SET ASIDE A RESERVE HERE FOR ALL CANADIANS.

AT AN INQUIRY INTO OWNERSHIP CLAIMS, MCCABE AND MCCARDELL RECEIVED SETTLEMENT COSTS.

IMMEDIATELY, THE GOVERNMENT BEGAN DEVELOPMENT -- AN ACCESS TUNNEL BLASTED TO THE CAVE AND A BATHHOUSE BESIDE THE BASIN. IN 1887, THIS RESERVE BECAME OUR FIRST NATIONAL PARK . . .

5. continued . . .

THE CAVE AND ITS HOT SPRING STILL LIE BELOW THIS HOLE. ACCESS IS FROM THE SOUTH BELVEDERE. THE STALACTITES ARE GONE, BUT THE MYSTERY STILL HANGS IN THE SULPHUR MISTS AT THIS BIRTHPLACE OF CANADA'S NATIONAL PARKS.

Story begins at other end.

IV. Cave Outlet

(Introductory Sign)

MINERAL WATERS

THIS IS NO ORDINARY WATER. JUST AS HOT WATER FILTERED THROUGH GROUND COFFEE BEANS BECOMES COFFEE, THIS STREAM HAS FILTERED THROUGH ROCKS DEEP IN THE EARTH TO BECOME WARM, MINERALIZED AND SLIGHTLY RADIOACTIVE -- HOT SPRINGS WATER.

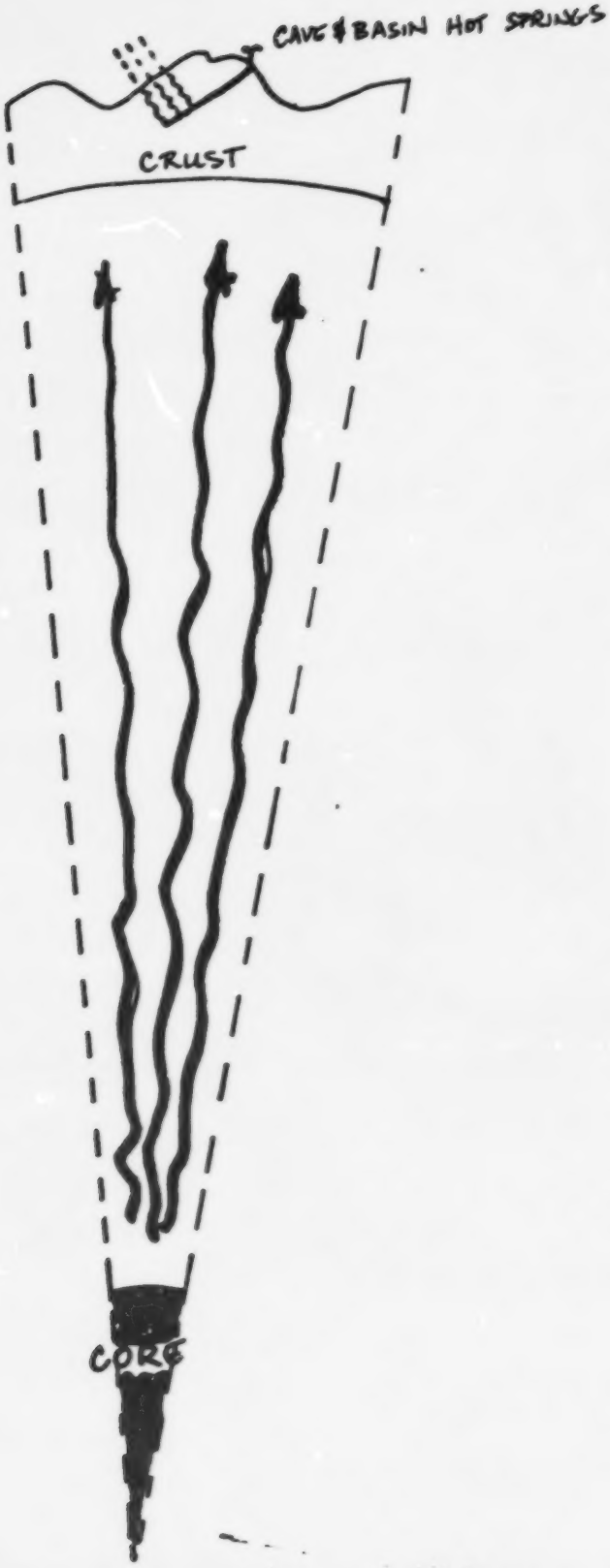
This story continues on the railing signs beside you.

(Railing Signs)

1. IT'S LIKE AN UPSIDE-DOWN COFFEE PERCOLATOR. THE WATER -- RAIN AND SNOW-MELT FROM THE OTHER SIDE OF THIS MOUNTAIN -- SEEPS DOWN MORE THAN 2 KM. THROUGH CRACKS IN THE ROCK. THERE, HEAT RADIATING OUTWARD FROM THE EARTH'S MOLTEN INTERIOR WARMS IT. THE STEAMY WATER FILTERS THROUGH ROCKS DEEP BENEATH YOUR FEET, AMASSING MINERALS -- INCLUDING ONE EVIDENT IN THE BOULDER NEXT TO YOU . . .

2. continued . . .

SCRATCH THE BOULDER WITH THE SPIKE AND SNIFF THE SCRATCH. THAT'S SULPHUR, A NATURAL PART OF THIS ROCK. IT'S EASY TO SEE WHY THE HOTSPRINGS SMELL OF SULPHUR, SINCE THE WATER PERCOLATES THROUGH THIS ROCK TYPE ON ITS JOURNEY THROUGH THE MOUNTAIN . . .


CAVE & BASIN HOT SPRINGS
CRUST
CORE

3. continued . . .

THERE IS A MYSTERY IN THE VERY SLIGHT RADIOACTIVITY OF THIS WATER. LIKE THE MINERALS, RADIOACTIVE ELEMENTS MUST BE DISSOLVED FROM THE ROCKS BELOW, SOME OF WHICH HAVE FAIRLY HIGH NATURAL RADIATION. BUT WHICH ROCKS, AND WHERE THEY LIE, IS UNKNOWN.

HEATED AND MINERALIZED, THE WATER IS FORCED UP THROUGH THE SULPHUR MOUNTAIN FAULT (OR FRACTURE), COOLING AS IT GOES, TO BUBBLE OUT AS THESE HOT SPRINGS.

Story begins at other end.

(INTRODUCTORY SIGN)

HEALING WATERS

MIRACLE CURES EFFECTED HERE! FOR AS LONG AS MAN HAS KNOWN THESE HOT SPRINGS, HEALING PROPERTIES HAVE BEEN ATTRIBUTED TO THE WATERS.

This story continues on the railing signs beside you.

RAILING SIGNS

1. 1906 - "THE MARVELLOUS CURES EFFECTED HERE HAVE BECOME KNOWN IN DISTANT LANDS, AND THE RESULT IS THAT INVALIDS FROM EVERY CONCEIVABLE PLACE COME HERE FOR TREATMENT, WHICH IN ALMOST EVERY CASE RESULTS IN A CURE."

   Department of the Interior Annual Report, 1905-06.

   1918 - "THE CHIEF AILMENTS FOR WHICH SULPHUR WATERS HAVE PROVED EFFICACEOUS ARE DISEASES OF THE SKIN, GOUT, CHRONIC RHEUMATISM AND SYPHILIS, FOR THE TREATMENT OF STIFF JOINTS, AND GUNSHOT WOUNDS, AND IN POISONING BY MERCURY OR LEAD."

   R.T. Elworthy, Mineral Springs of Canada, Part II.

   1980 $ - HOT SPRINGS BATHS MAY BE USED FOR MUSCULAR PROBLEMS AND RELAXATION THERAPY, AND SULPHUR IS STILL A COMMON COMPONENT OF SKIN OINTMENTS. MOST OTHER MEDICAL CLAIMS HAVE BEEN DISCOUNTED.

2. 1917 - BENEFITS CLAIMED FOR RADIOACTIVE HOT SPRINGS INCLUDE: "... INCREASED ACTIVITY OF ALL THE PROCESSES OF NUTRITION AND METABOLISM ... INCREASED OXIDATION ... A CONSIDERABLE MULTIPLICATION OF THE RED BLOOD CELLS ... AN ANTIBACTERIAL EFFECT ... (AND) POWER TO STIMULATE THE ELIMINATION OF TOXINS."

Satterly & Elworthy, Mineral Springs of Canada, Part I.

1980s - SOME LEVEL OF RADIOACTIVITY IS NATURAL IN OUR ENVIRONMENT; ELEVATED LEVELS ARE NOW KNOWN TO BE HARMFUL. THIS WATER EMITS LESS RADIATION THAN _____.

3. 1912 - THE BOTTLING WORKS WERE RUNNING OVERTIME AS THE BANFF HOT SPRINGS SANITARIUM BOTTLING CO. PUT UP "BANFF LITHIA WATER" FROM THESE SPRINGS. DRINKING SULPHUR WATER WAS REPUTED TO BE GOOD FOR THE DIGESTION AS WELL AS THE LIVER AND KIDNEYS.

1980s - THIS WATER IS NO LONGER BOTTLED, BUT MINERAL WATER IS MAKING A COMEBACK. DOMESTIC AND IMPORTED BRANDS CAN BE FOUND IN MOST GROCERY STORES.

(Introductory Sign)

ROCK FROM WATER

Heal disease? Maybe. But this water has a more astounding property. It makes rock.

This story continues on the railing signs beside you.

(Railing Signs)

1. Released from the pressure of its underground channel, the hot springs water begins to drop the load of minerals gained in the depths of the earth. The dissolved calcium carbonate hardens to form tufa, the rock lying all around you.

2. continued . . .

Since the last ice age, these springs have been depositing calcium carbonate. This entire hillside is made of tufa to a depth of 7 m.

Compare these two rocks: the limestone from which the calcium carbonate was originally dissolved, and the porous, gray-brown tufa it created.

(Introductory Sign)

ROCK FROM WATER

Heal disease? Maybe. But this water has a more astounding property. It makes rock.

This story continues on the railing signs beside you.

(Railing Signs)

1. Released from the pressure of its underground channel, the hot springs water begins to drop the load of minerals gained in the depths of the earth. The dissolved calcium carbonate hardens to form tufa, the rock lying all around you.

2. continued . . .

Since the last ice age, these springs have been depositing calcium carbonate. This entire hillside is made of tufa to a depth of 7 m. Soft, porous and changeable in nature, the tufa caused many problems for construction of these buildings, resulting in their complete renovation in 1982-84.

Compare these two rocks: The limestone from which the calcium carbonate was originally dissolved, and the porous, gray-brown tufa it created.

VI. Cave Inlet

(Introductory Sign)

ROCK FROM WATER

Heal disease? Maybe. But this water has a more astounding property. It makes rock.

This story continues on the railing signs beside you.

(Railing Signs)

1. Released from the pressure of its underground channel, the hot springs water begins to drop the load of minerals gained in the depths of the earth. The dissolved calcium carbonate hardens to form tufa (pronounced too-fa), the rock lying all around you.

2. continued . . .

Since the last ice age, these springs have been depositing calcium carbonate. This entire hillside is made of tufa to a depth of 7 m. Soft, porous and changeable in nature, the tufa caused many problems for construction of these buildings, resulting in their complete renovation in 1982-84.

Compare these two rocks: The limestone from which the calcium carbonate was originally dissolved, and the porous, gray-brown tufa it created.

BATHHOUSE

Formative Evaluation of Bath House Texts

Preliminary Report

As the road to the Cave & Basin site was closed September 20, evaluation could no longer be done there. The Banff Museum was chosen as the next best location considering proximity, number, and type of visitors. Results obtained from this evaluation were not as good as they might have been had the evaluation been on site. Out of context, it is a little harder to explain to visitors, what is taking place and why. In general terms, however, there was still an indication of which text didn't work and required revision.

Macdonald Train

The first results obtained for this section demonstrated that the text was not meeting some stated objectives. For that reason, evaluation was discontinued after 6 responses as it was apparent that a re-write was in order.

Both preliminary and revised results are presented. Although #1 has adequate results, it will be noted that #'s 2, 3, 5, show a definite need for some revision in the text.

No open format questions were done for the Bath House questions due to lack of time. If these questions are desired, something may be worked out in terms of a volunteer project or having someone else on the project do this work. This also applied to any revisions deemed necessary as a results of this report.

1. objective: visitors will know that the railway played an important role in the formation of Canada's first national park.

What national construction project was linked with the discovery of the Cave & Basin hot springs?

a. Population centres
b. *Transcontinental railway*
c. Grain elevators across the prairies
d. St. Lawrence Seaway

Preliminary results:	a.	0	0
	b.	*6*	*100*
	c.	0	0
	d.	0	0
		6	100%
Revised results:	a.	3	15
	b.	*17*	*85*
	c.	0	0
	d.	0	0
		20	100%

The results of the revised text are probably lower due to a larger sample size, but are still high enough to reflect an adequate text.

2. objective: 90% will know that BNP was founded because of the hot springs.

One result of the discovery of the hot springs was the founding of:

a. *Banff National Park*
b. The Banff Centre
c. British Columbia
d. Lac Des Arcs

Preliminary results:	a.	*4*	*66.7*
	b.	2	33.3
	c.	0	0
	d.	0	0
		6	100%
Revised results:	a.	*15*	*75*
	b.	5	25
	c.	0	0
	d.	0	0
		20	100%

Although there is some improvement, the stated objective is not being met. Once again, it may be mentioned that evaluation did not succeed as well as it might have because of the location.

3. objective: 80% will know that the first reserve was established about 100 years ago.

About how long ago did the government establish the reserve which later became the first national park?

a. 120 years
b. *100 years*
c. 80 years
d. 60 years

preliminary results:	a.	0	0
	b.	*3*	*50*
	c.	3	50
	d	0	0
		6	100%
Revised results:	a.	0	0
	b.	*17*	*85*
	c.	3	15
	d.	0	0
		6	100%

The revisions touching on this point were successful.

4. objective: 90% will know that Banff was our first national park.

What was Canada's first national park?

a. Waterton Lakes National Park
b. Yoho National Park
c. Jasper National Park
d. *Banff National Park*

Preliminary results:	a.	1	16.6
	b.	0	0
	c.	0	0
	d.	5	83.4
		6	100%
Revised results:	a.	1	5
	b.	1	5
	c.	1	5
	d.	17	85
		20	100%

Although not meeting the stated objective, it is suggested that this high percentage reflects a clear and understandable text.

5. objective: visitors will know that the government was strongly motivated by money in creating the federal reserve.

A strong motive behind the government's establishment of the first national park was to gain more:

a. wilderness
b. power
c. money
d. trade

preliminary results:	a.	1	16.7
	b.	1	16.7
	c.	3	50
	d.	1	16.7
		6	100%
Revised results:	a.	3	15
	b.	3	15
	c.	13	65
	d.	1	5
		20	100%

These rather low results may be partly a result of an ambiguous question. It may be fair to say that there is no one right answer. In any case, the majority are realizing the role that dollar signs played in the history of national parks.

The only information matching this question in the text is "this fledgling company desperately need the passenger business that tourists would bring." Perhaps the question would be better if it was reworded.

5A. When the revision of the Macdonald Train text was done, it was also decided to text another objective.

objective: visitors will realize that Sir John A. travelled through this are about 100 years ago.

In 1886, our first Prime Minister, Sir John A. Macdonald

a. created a new design for cowcatchers
b. discovered the hot springs
c. toured this area by train
d. wanted to isolate the western provinces.

results:

a.	0	0
b.	0	0
c.	*18*	*90*
d.	2	10
	20	100%

PARKS YESTERDAY: INTRO AND RESORT ERA.

6. objective: 60% will know that attitudes toward national parks have changed over the last century.

Over the last 100 years, attitudes toward national parks have:

a. remained the same
b. changed only slightly
c. *undergone many changes*
d. become more commercial

results:

a.	1	5
b.	3	15
c.	*16*	*80*
d.	0	0
	20	100%

7. objective: visitors will know that one of the earliest attitudes was that the parks must be "improved" to be enjoyed.

During the 1880's and 1890's, it was believed that for the park to be acceptable to the wealthy visitors it must be:

a. *developed and made more civilized*
b. isolated from outside contact
c. heavily populated with wildlife
d. free from industry

results:

a.	*15*	*75*
b.	0	0
c.	3	15
d.	2	10
	20	100%

8. objective: visitors will know that "improvements" were the additions of the comforts of home.

During the Resort Era of national parks, "improvements" included:

a. getting back to nature
b. preserving the ecology
c. driving out industry
d. *adding the comforts of home*

results:

a.	2	10
b.	4	20
c.	0	0
d.	*14*	*70*
	20	100%

The Resort Era texts were well liked and understood by respondents. Overall results are quite high and no text change is suggested.

RESOURCE EXTRACTION

This was another area of evaluation in which it became quickly apparent that revision was necessary. Without exception, people found one of the original texts long and ambiguous.

9. objective: visitors will know that at one time industrial development was encouraged as being beneficial to the park.

During the early 1900's, which of the following was thought to be a beneficial addition to the park?

a. *Industry*
b. Information centres
c. Gas stations
d. Fruit trees

Preliminary results:	a.	5	62.5
	b.	1	12.5
	c.	0	0
	d.	2	25.0
		8	100%
Revised results:	a.	3	25.0
	b.	2	16.7
	c.	0	0
	d.	1	8.3
		12	100%

10. objective: visitors will know that the early concept of conservation in BNP meant consumption and exploitation of our natural resources in a careful manner.

During the period of resource extraciton, the concept of conservation in Banff National Park:

a. was entirely unknown
b. *meant careful consumption of natural resources*
c. was aimed at preserving the wilderness intact
d. discourage the development of coal mines

preliminary results:	a.	2	25
	b.	1	12.5
	c.	3	37.5
	d.	2	25
		8	100%
revised results:	a.	4	33.3
	b.	7	58.3
	c.	1	8.3
	d.	0	0
		12	100%

Athough these results have significantly improved with the test change, it is still a rather low score. This could possibly be improved by a further text rewrite.

RECREATION

11. objective: 20% will know that J.B. Harkin influenced early development of tourism in National Parks.

J.B. Harkin, the first Commissioner of Dominion Parks in 1911, encouraged which activity in National Parks?

results:

a. Mining
b. Hunting
c. *Tourism*
d. Oil extraction

a.	5	25
b.	0	0
c.	*18*	*75*
d.	0	0
	20	100%

This text clearly meets the stated objective. The letter portion was well understood when explained that it was to be a child's essay on his summer vacation.

BALANCE

12. Objective: 60% will know that parks today attempt to balance preservation and recreation.

Today, Parks Canada:

a. favours recreation over preservation of resources
b. is strictly oriented toward preservation
c. *attempts to balance recreation and preservation*
d. leaves all resources in their natural state.

results:

a.	1	5
b.	3	15
c.	*13*	*65*
d.	3	15
	20	100%

One comment made during this evaluation was that the diary section seemed a bit long and gushy. It would be preferable to have something a little more concise according to this one person. Perhaps when the diary is reworked, more information should be added so the visitors will know who might have written it, e.g., signed by Wendy Malton, Banff - plus more indication in letter about the age of the writer.

PARKS TOMORROW

13. objective: 50% will know that Parks Canada protects our natural and culture heritage.

Parks Canada protects:

a. our natural heritage
b. our cultural heritage
c. *both a and b*
d. neither a nor b

results:	a.	2	10
	b.	4	20
	c.	14	70
	d.	0	0
		20	100%

14. objective: 80% will know that Parks Canada is trying to expand to cover all natural and historic regions.

Parks Canada is in the process of expanding in order to include:

a. parts of other countries
b. many provincial parks
c. more mountain regions
d. examples of all natural and historical regions.

results:	a.	0	0
	b.	3	15
	c.	4	20
	d.	13	65
		20	100%

This is not reaching the objective that has been set out. Possibly the text is confusing without the graphics which are to accompany it. Some revision may be in order.

VERSION 1

BATH HOUSE TEXTS

MACDONALD TRAIN

In 1886, our first prime minister, Sir John A. Macdonald, and his wife Lady Agnes, toured this area in a special train. Part of the journey found them riding in front on the cowcatcher.

To induce British Columbia to join the newly-formed country of Canada, the Canadian government promised them a railway. The ribbon of steel would tie isolated Pacific coast settlements to the population centres of Ontario and Quebec. The line was driven through this wilderness in 1883.

Railway survey workers discovered the hot springs that became the centre of our first national park - Banff.

Sir Sandford Fleming, chief engineer for the Canadian Pacific Railway (CPR), was one of the first to suggest Canadian national parks. He proposed one in the Rocky Mountains and another in northern Ontario:

". . . the number of strangers who would visit them would become a source of general profit."

William Cornelius Van Horne. This hard-driving general manager of the CPR needed passengers to pay the debts of his financially-troubled railway. He proposed a national parks near Lac Des Arcs (just east of Banff):

"Since we can't export the scenery, we shall have to import the tourists."

Sir John A. Macdonald, head of the government that set aside our first reserve, saw the new national park as a showpiece for the world:

"I do not suppose in any portion of the world there can be found a spot . . . which promises in as great a degree not only large pecuniary advantage to the Dominion but much prestige to the whole country . . ."

VERSION 2

MACDONALD TRAIN TEXT

(LABEL FOR TRAIN)

CANADA'S PRIME MINISTER AND HIS WIFE RIDING ON THE FRONT OF A STEAM ENGINE! THE VERY THOUGHT HORRIFIED THEIR AIDES. BUT LADY AGNES INSISTED, AND HER HUSBAND, OUR FIRST PRIME MINISTER SIR JOHN A. MACDONALD, OBLIGED.

THIS SCENE TOOK PLACE A CENTURY AGO, IN 1886. THE COUPLE WERE CROSSING CANADA TO VIEW THE RECENTLY FINISHED RAILWAY AND THE NEW HOT SPRINGS RESERVE.

(TEXT PANEL)

IT IS FITTING THAT THE PRIME MINISTER WHO SET ASIDE BANFF, OUR FIRST NATIONAL PARK, SHOULD SEE THE PARK BY TRAIN. NATIONAL PARKS WERE BORN LARGELY BECAUSE OF THE CANADIAN PACIFIC RAILWAY (CPR).

THIS FLEDGELING COMPANY DESPERATELY NEEDED THE PASSENGER BUSINESS THAT TOURISTS WOULD BRING. AS EARLY AS 1883, CPR OFFICIALS WERE SUGGESTING NATIONAL PARKS.

THAT SAME YEAR, IT WAS RAILWAY SURVEY WORKERS WHO DISCOVERED THESE CAVE & BASIN HOT SPRINGS. WHEN LEGAL BATTLES ENSUED OVER THEIR OWNERSHIP, THE GOVERNMENT TURNED TO THE NATIONAL PARK IDEA, AND IN 1885 BANFF NATIONAL PARK WAS BORN.

VERSION 2

PHOTOS - MACDONALD TRAIN

SIR SANDFORD FLEMING, CHIEF ENGINEER FOR THE CANADIAN PACIFIC RAILWAY:

"THE NUMBER OF STRANGERS WHO WOULD VISIT [NATIONAL PARKS] WOULD BECOME A SOURCE OF GENERAL PROFIT."

1883

WILLIAM CORNELIUS VAN HORNE, GENERAL MANAGER OF THE CPR:

"SINCE WE CAN'T EXPORT THE SCENERY WE SHALL HAVE TO IMPORT THE TOURISTS."

1885

SIR JOHN A. MACDONALD, HEAD OF THE GOVERNMENT THAT SET ASIDE OUR FIRST PARK RESERVE:

"I DO NOT SUPPOSE IN ANY PORTION OF THE WORLD THERE CAN BE FOUND A SPOT... WHICH PROMISES IN AS GREAT A DEGREE NOT ONLY LARGE PECUNIARY ADVANTAGE TO THE DOMINION BUT MUCH PRESTIGE TO THE WHOLE COUNTRY."

1886

PARKS YESTERDAY

Introductory panel:

From Bustles to Bikinis

As fashions of dress in Canada altered, so did styles of thought. In the last hundred years, attitudes toward national parks have undergone many changes.

A strange mixture of civilization and wilderness, Banff National Park must be understood through its history. Each of the stages in the evolving attitudes toward parks is represented in this, our first national park.

PARKS YESTERDAY

Resort era:

The first national park was seen as a pool of civilization carved out of the wilderness, a money-making enterprise developed for the world's wealthy:

> "In order to make a park of this tract of land, of course, it becomes necessary to improve it . . ."
>
> Government Lead of the Senate, 1887.

> "It has all the qualifications necessary to make it a great place of resort . . . and if carefully managed it will . . . recuperate the patients and recoup the treasury."
>
> "A portion of the park offers some beautiful sites for villas . . . to be leased to people of wealth."
>
> Sir John A. Macdonald, House of Commons, 1887.

July 20, 1890.

Dear Beatrice,

We arrived in Banff on Thursday last, and installed ourselves in our quarters at the Banff Springs Hotel. This latter is barely two years old, and very grand indeed.

The train ride was comfortable, if somewhat tedious. I never dreamed possible the extent of the wilderness in this land. Near to Banff we saw a coyote skulk off into the woods. Mr. Wilson was quick to assure us that within the national park they are eliminating all such vermin, while the gentler animals are saved from hunting.

It was a relief to reach civilization once more at the Banff station. The days have passed most pleasantly, with steam yacht tours of the Bow River, carriage rides along the many roads, and bathing in the wonderful hot springs waters.

In the matter of healing properties, these springs have claims superior to any in North America. One bath house wall sports a crutch with the following inscription: "The man who used this crutch is cured, and gone home."

I must leave you now, as William is here, and we shall take tea in the parlour.

Cordially,

Adeline.

PARKS YESTERDAY

Resource Extraction

The settlement of the west occupied the thoughts of the nation in the prosperous early years of this century. Canada dreamed of a strong country forged from the wilderness. National parks must play their role; industrial development in parks was encouraged:

> "Bankhead [a coal mining development], instead of being a detriment to the beauty of the park, will on the contrary add another to the many and varied attractions of the neighbourhood"
>
> Annual Report, Department of the Interior, Ottawa, 1903-04.

> "The industrial assets of the park have been increased since last year by the establishment of a . . . cement mill of large capacity."
>
> Annual Report, Department of the Interior, Ottawa, 1904-05.

VERSION 1

PARKS YESTERDAY

Resource Extraction

Banff
May 9, 1910.

Mr. D.R. Matthews
Matthews, Fletcher and Carmichael
Montreal.

Dear Sir,

Thank you very much for yours of the 5th inst. In response to your request for information on investment in the National Park Reserves, I humbly submit the following for your perusal.

There exists a small but growing school of thought in the United States which is known as conservation. This is an unfortunate name, since it has nothing in common with our progressive philosophy of conservation, to wit the careful and considered use of those resources which nature has so generously bestowed upon this nation. This new philosophy advocates the complete withdrawal from any form of development of large tracts of land.

I pray that this insanity has not reached the ears of any of our elected representatives in Ottawa. There have been occasional speeches in the Houses denouncing mining and other industrial enterprises in National Park Reserves, mostly on the grounds of their unsightly nature. Fortunately none of these has been to any degree fruitful, and the Superintendents of the various Park Reserves appear to favour industrial expansion.

It is true that there is to be found some discontent among certain residents of the Parks. I call to your attention a body of citizens living near and in the Waterton Lakes Forest Park. Several years past they wrote to the Secretary of the Interior decrying the fact that more than half of the park land has been reserved for petroleum exploration.

At present the enterprises functioning with the Park Reserves include coal mines, cement works, hot springs water bottling companies, lead-zinc mines, timber berths, petroleum exploration and drilling, and quartz mining claims.

I trust that the foregoing suits your requirements.

Yours truly,

R.G. Barnsley.

VERSION 2

DAILY LOG

May 9, 1910 I have just returned to Banff from visits to Yosemite and Yellowstone National Parks in the United States.

I was most suprised to find how greatly the philosophy there differs from our own. Whereas we encourage such uses of the landscape as coal mining, cement works, lead-zinc mines and petroleum exploration, with them it is quite the opposite. They talk increasingly of preservation of the wilderness.

This concept appears strange to those of us who are surrounded by seemingly endless amounts of undeveloped land. This new movement is called conservation, but it is very unlike our philosophy of sustained resource use which goes by the same name. Its leaders are a Yosemite man named John Muir, and no less a personage than U.S. president Theodore Roosevelt.

I cannot see such a position taking hold to any degree in Canada, where our resources are virtually without limit...

PARKS YESTERDAY

Recreation:

The automobile changed the course of Canadian society. It set off a recreation boom, and for the first time the middle classes flocked to national parks. In 1911 Canada became the first country in the world to have a government agency specifically to control park lands. Its head was J.B. Harkin.

Harkin discouraged industries and encouraged tourism as a means of paying for parks:

> "The commercial potentialities of tourist traffic are startling. . . National Parks are one of the best means of attracting this tourist traffic."
>
> J.B. Harkin

He also started Canada's national historic parks system, and helped encourage a more ecological view of parks:

> ". . . while we were forced in the beginning to stress the economic value of national parks we realized that there were other values far more important which would be recognized in time."

Report on our National Parks June 4, 1950
by Billy James

There is more money now than their used to be. Everyone says so, but no one knows where it came from. My Daddy says that is how come the national parks are crowded when we go on holidays. Last summer we went to Banff, there were lots of people there. Daddy says that soldiers like to travel, they did lots of it during the war and now there are a bunch of soldiers left over cause there are no more wars. There are 17 national parks. National parks are where there are campgrounds and beaches and swimming pools and trails and Mommy and Daddy play golf. Bob's family has a cottage in the park. We don't, there is not enough money for that.

PARKS YESTERDAY

Balance:

From pools of civilization in the wilderness, national parks became pockets of wilderness in a cultivated landscape. The 1960's and 70's brought the age of ecology, and with it the realization that unrestrained recreation could damage parks as surely as logging and mining. Today's national parks attempt to balance preservation and use:

> "National parks are special places whose importance transcends their immediate contribution to our gross national product."
>
> "Because national parks are dedicated to future as well as present generations, impairment by overuse, improper use and inappropriate development must be avoided."
>
> Parks Canada Policy, 1979.

Dear diary, July 20, 1980.

What a fabulous weekend. Just got back from a camping trip to Lake O'Hara. That's got to be one of the most beautiful places on earth. Even if I did freeze at night. There's still patches of snow on some of the trails!!

Saturday we hiked up to Opabin Plateau. Rounding a corner we saw five incredible hunks working on the trail, so I sidled up and started a conversation. These guys spend every summer up here! They're rebuilding all the trails. They've got to do that cause there are so many people hiking them they get worn down. Then when it rains the trails become streams, and people go off the trail so they don't have to walk in the water and mud. Some areas are so trampled and criss-crossed with trails the wildflowers don't grow there anymore. That's what the head of this crew said, anyway.

He's been around here for a long time and he says it's changed a lot. There used to be more flowers and different kinds of plants, and even more grizzly bears before there were so many people. He sometimes wishes the park would make rules so not so many people come here, and it would be more like true wilderness again. But instead they're trying to teach people how to behave so it can stay wilderness even with people in it. He says that's the job of the park naturalist.

So Sunday we went on a guided hike with the naturalist. She talked about how it's a harsh environment, with the cold and wind and intense light, and how important it is to stay on the trails and not crush the poor plants. It's a wonder anything survives here.

Lake O'Hara sure is neat. The only problem is that it's so hard to get a reservation on the bus in. Sometimes they're full weeks ahead of time. Why don't they have twice as many buses so everybody who wants can go there?

PARKS TOMORROW

Introductory panel:

Imagine doing a jigsaw puzzle. Slowly you realize that something is wrong. Half the pieces are missing. You can never see the whole picture until those pieces are found and put in place.

Canada has many types of landscape, each a piece of this country's heritage. Only some pieces are now part of our national park system. To complete the jigsaw we need examples of all of Canada's natural regions.

Canada's rich history is our cultural heritage. Some of this past is pictured in our national historic parks and sites, but the image is far from complete.

Parks Canada is finding pieces to finish the jigsaw. Parks tomorrow will show a complete picture.

LOWER TRAIL

Formative Evaluation: Lower Trail System

Final Report

It would be difficult and time consuming to follow the same procedures as those used for the Upper Trail, i.e. a guided walk on the site of the trail. Instead it was decided to place the texts in the alcoves of the Lower South Belvedere and to approach people as they entered the belvedere or came out of the Cave. Usually people were drawn to the displayed text and photos thus assuring us of cooperation from most people.

The text was initially tested in three sections:
SWAMP AREA and MARSH OVERLOOK; BIRD BLIND; and SLIMY STOP and DISCOVERY. "Slimy Stop", of course, was deleted as a visible title. For the open format questions, the text to be read was divided such that there was only one unit, i.e. SWAMP, MARSH, FISH, BIRDS, SLIMY, DISCOVERY.

SWAMP AREA.

1. objective: 90% of visitors who have walked the lower trail will know that the hot springs water changes the surrounding environment.

closed: The warm water of the hot springs:

a. *changes the environment and makes it unique in Banff National Park*
b. causes almost all plant life to die
c. has no effect on the environment of Banff National Park
d. flows intermittently

results:		
a.	*40*	*97.6*
b.	1	2.4
c.	0	0
d.	0	0
	41	100%

open: What is the general effect of the hot springs on the surrounding environment?

results:		
correct	*16*	*80*
incorrect	1	5
don't know	3	15
	20	100%

The correct responses to this open question included "making the environment more lush, enhanced; plants grow there that normally wouldn't". This text, successful now, will be even more so when read in context. This applies to the whole of the Lower Trail texts.

2. objective: 80% will know that the water of the hot springs does not freeze in winter.

closed: In winter, the hot springs:

a. freeze over quite early
b. dry up
c. increase their flow threefold
d. *remain unfrozen all season*

results:		
a.	0	0
b.	0	0
c.	1	2.4
d.	*40*	*97.6*
	41	100%

open: Do the hot springs freeze in winter?

results:			
	correct	*20*	*100*
		20	100%

There was an unfortunate choice of format here in that there are only two possible responses - yes or no. Because the choice is so limited higher results are inevitable. This is seen again in #7 and now having been identified as a problem may be avoided in future questionnaires.

3. objective: 50% will know that some plants (e.g. watercress) stay green all winter because of the hot springs.

closed: Watercress, a plant common around the springs

a. shrivels and dies in early fall
b. *stays green all winter*
c. blooms around Christmas Day
d. produces large fruits in the summer.

results:			
	a.	1	2.4
	b.	*36*	*87.8*
	c.	1	2.4
	d.	0	0
	no response	3	7.4
		41	100%

open: What happens to the watercress at the Cave & Basin in the winter?

results:			
	correct	*13*	*65*
	incorrect	2	10
	don't know	5	25
		20	100%

4. objective: 40% will know that the flora includes a variety of orchid species.

closed: Interesting plants found at the Cave & Basin site include:

a. dandelions
b. longnose dace
c. *six species of orchids*
d. 10 varieties of insect-eating plants

results:			
	a.	0	0
	b.	6	14.6
	c.	*34*	*83.0*
	d.	1	2.4
		41	100%

open: What unusual plants may be seen down in the marsh?

results:			
	correct	*16*	*80*
	incorrect	4	20
		20	100%

Generally the SWAMP AREA texts require no revision and in fact, most people stated that they found the text very clear. There was one particularly negative comment from a man who was quite put out at not being able to swim. People with this attitude are not likely to go down to the lower trail in any case.

The SWAMP AREA texts were the only ones that were not revised in some manner. It will be noted that all of the following attached texts have more than one version. Those marked FINAL VERSION indicate a grammatical or word change and did not undergo formative evaluation. Often the alterations had nothing to do with factual content, and the results already obtained are applicable. Those texts marked VERSION I or VERSION 2 were tested for effectiveness as some objective was affected by the alterations.

MARSH OVERLOOK

5. objective: 40% will know that some birds that normally migrate remain in the area because of the warmth of the hot springs.

closed: One effect of the hot springs on birds is to:

a. make them lay eggs earlier
b. *cause normally migratory birds to remain in winter*
c. cause them to migrate north to cooler areas
d. cause them to change their songs

results:		
a.	0	0
b.	*40*	*97.6*
c.	0	0
d.	0	0
no response	1	2.4
	41	100%

open: Can you see any unusual birds here in the winter? Why?

results:		
correct	*15*	*75*
incorrect	2	10
don't know	3	15
	20	100%

One incorrect response was that unusual birds were found in the marsh because they had migrated there. All seemed to grasp that the warmth of the marsh has an effect on the wildlife.

6. objective: 50% will know that tropical aquarium fish have been released here and have survived.

closed: What life form has been introduced to and survived in this marsh?

a. *Tropical fish*
b. Robins
c. Trout
d. Rare Orchids

results:		
a.	*38*	*92.8*
b.	1	2.4
c.	1	2.4
d.	0	0
no response	1	2.4
	41	100%

open: Can tropical fish survive in these waters?
How do you know?

results:			
(1st part)	correct	*18*	*90*
	incorrect	1	5
	don't know	1	5
		20	100%
(2nd part)	correct	*17*	*85*
	incorrect	3	15
		20	100%

It was suggested that the word experiment was somewhat misleading. The text was revised such that there was no impression of a white-smocked scientific undertaking.

7. objective: visitors will know that release of alien species is illegal.

closed: The introduction of alien species into a national park is now:

a. widely practised
b. under the control of ecology experts
c. only allowed in certain areas
d. *illegal*

results:		
a.	0	0
b.	10	24.4
c.	4	9.7
d.	*27*	*65.9*
	41	100%

open: Is it O.K. to introduce exotic species into a National Park?
Why?

results:		
correct	*18*	*90*
incorrect	2	10
	20	100%

The increased success rate with the open question is likely due to the same problem encountered earlier. As there are only two possible responses, the chances of answering correctly are greatly increased. As previously stated, the difficulty may be avoided once identified.

8. objective: 50% will know that the Banff longnose dace is rare and endangered.

closed: The Banff longnose dace is:

a. common throughout Canada
b. a prehistoric fossil found at the Cave & Basin
c. *a minnow especially adapted to this area*
d. a rare bird species

results:		
a.	0	0
b.	2	4.8
c.	*37*	*90.2*
d.	2	4.8
	41	100%

open: What is the Banff longnose dace?

results:			
	correct	17	85
	incorrect	2	10
	don't know	1	5
		10	100%

Where else in Canada can you find it?

results:			
	correct	17	85
	don't know	3	15
		20	100%

A problem arose in that this question did not directly measure the objective. Although people know that the dace is a minnow it was not tested whether they picked up on the attributes rare and endangered. A retest was developed as follows:

Based on the description in the text, choose <u>two</u> words which best describe the Banff longnose dace.

thriving	predatory	
colourful	endangered	
rare	boldly marked	
diseased		

results:			
	rare	17	85
	endangered	18	90
	boldly marked	3	15
	colourful	1	5
	thriving	1	5
		40	200
		2	2
		=20	=100%

These results show that high levels of learning are taking place. No change in text content is necessary to meet the objective.

9. objective: 50% will know that the Banff longnose dace may be in danger of extinction because of competition with other fish species.

closed: The longnose dace may be endangered because

a. they have been hunted extensively in the past
b. the warm habitat is dangerous for them
c. they have cross-bred widely with the tropical fish
d. *they must compete with the tropical fish*

results:			
	a.	3	7.3
	b.	1	2.4
	c.	2	4.9
	d.	33	80.5
no response		2	4.9
		41	100%

open: Why are the longnose dace in danger of extinction?

results:			
	correct	*14*	*70*
	incorrect	2	10
	don't know	4	20
		20	100%

The two incorrect responses were that the dance are endangered because this is the only place they are found. Although not the specific response we were looking for, this is partly true and should be considered as supporting the text in its present form.

BIRD BLIND

This is a detailed section of text which had no corresponding specific objectives in the media package. Consequently there was an attempt to make the evaluation questions fairly general. Much of the impact of these texts depends on the visitor being able to see colourful diagrams corresponding to the descriptions which are presented. The closed format results showed low recall. Our response was to split the text into smaller portions: FISH and BIRDS, such that there was less to read for the open questions. Results greatly improved.

10. objective: visitors will be able to identify from a list the name of a species of fish found in the marsh.

closed: One fish likely to be seen in the marsh is

a. *Banff longnose dace*
b. killdeer
c. black bass
d. pike

results:			
	a.	*23*	*56.1*
	b.	7	17.1
	c.	5	12.2
	d.	2	4.9
no response		4	9.7
		41	100%

open: Name one fish likely to be seen in the area.

results:				
	mosquitofish	9		41.0
	dace	3	*19*	*86.5* 13.6
	jewelfish	7		31.9
	incorrect		1	4.5
	don't know		2	9.0
			22	100%

11. objective: visitors will be able to identify a winter bird from a list.

closed: One bird likely to be found in the marsh in the winter is:

a. molly
b. *killdeer*
c. purple vetch
d. barn swallow

results:			
	a.	5	12.2
	b.	*31*	*75.6*
	c.	2	4.9
	d.	2	4.9
no response		1	2.4
		41	100%

open: Name one bird that can be found in the marsh in winter.

results:				
killdeer	6			30%
robin	6			30
mallard	2			10
snipe	1	= 15	75	= 5
incorrect		1	5	
don't know		4	20	
		20	100%	

One fact noted during evaluation is that many people did not pick up on the winter/summer difference between the birds. Thus the introductory portions of these texts were revised in order to be more emphasized.
Evaluation of these introductions went as follows:

How are the Killdeer, Robin, Mallard, and Snipe different from the Yellowthroat, Red-Winged Blackbird, Green-Winged Teal, and Ruby-Crowned Kinglet?

a. the first group lays more eggs
b. *the first group stays at the marsh in winter*
c. the second group stays at the marsh in winter
d. the second group have louder songs

results:		
a.	0	0
b.	14	70
c.	2	10
d.	2	10
don't know	2	10
	20	100%

These results demonstrate that the introductions are clear and that the important difference between these birds is being learned.

SLIMY STOP

12. objective: visitors will realize that algae is present in the streams.

closed: The waving strands in the stream are:

a. *algae*
b. longnose dace
c. watercress
d. snakes

results:		
a.	33	80.5
b.	0	0
c.	7	17.1
d.	1	2.4
	41	100%

open: What kind of plant life is abundant in the streams?

results:		
correct	24	96
don't know	1	4
	25	100%

13. objective: visitors will know that algae is an important food source in the marsh community.

closed: Algae is important because it:

a. pollutes the stream
b. makes the stream smell like sulphur
c. *provides an important food source*
d. consumes certain dangerous fish species

results:			
	a.	0	0
	b.	0	0
	c.	*41*	*100*
	d.	0	0
		41	100%

open: Why is algae important to the marsh?

results:			
	correct	*22*	*88*
	don't know	3	12
		25	100%

14. objective: 40% will know that this is one of the few places in BNP where garter snakes may be found.

closed: A reptile, rarely occurring in Banff National Park, but found here on the hillside is:

a. long-toed salamander
b. longnose dace
c. *garter snake*
d. rattlesnake

results:			
	a.	1	2.4
	b.	0	0
	c.	*40*	*97.6*
	d.	0	0
		41	100%

open: Are the garter snakes, which are found in this area common in the rest of Banff National Park?

results:			
	correct	*22*	*88*
	incorrect	2	8
	don't know	1	4
		41	100%

General comments on the "slimy stop" included praise of the introduction. People found it catchy and intriguing. A comment was made about the phrase "bread and butter" - one woman thought this could be misleading.

THE DISCOVERERS

15. objective: 50% will know that the discoverers came from the direction of the marsh.

closed: The men who discovered the Cave & Basin in 1883 approached from:

a. *north, the marsh*
b. south, the hill
c. east, the townsite
d. west, Sundance Canyon

results:			
	a.	*4*	*16.7*
	b.	11	45.8
	c.	6	25.0
	d.	3	12.5
		24	100%

These results being quite unacceptable, the text was rewritten. The discovery story was told in a slightly altered perspective, focusing on the "following in the footsteps" theme.

This was tested by means of an open question:

How is the marsh connected with the discovery of the Cave & Basin?

results:			
	correct	*5*	*50*
	don't know	5	50
		10	100%

Although this meets the stated objective, it appeared to be confusing some people. It was generally a case of people not comprehending the question rather than not getting the information. Because much of the text is relevant only to the marsh itself, the location of the evaluation was moved to the area above the washrooms. From there a view of the marsh is available, which, it was hoped, would make the text more meaningful.

Using the same question as above, the results:

correct	*6*	*60*
don't know	4	40
	10	100%

Although these results are not strikingly positive, they do meet the objective stated. While questioning people about this text, I made a point of asking if they found the text clear, easy to read, was there anything they didn't understand. It was through this general conversation that it became apparent that the text is enjoyable to read and well liked. The only comment made concerned the axe - some did not seem to consider it very relevant. This has been removed in the final version, not retested.

LOWER TRAIL SYSTEM

SWAMP AREA

INTRODUCTION

THIS FRAGILE LANDSCAPE HAS BEEN CHANGED BY WARM RUNOFF FROM THE HOT SPRINGS ABOVE. THE PLANT COMMUNITY HERE IS DIFFERENT FROM ANY OTHER IN BANFF NATIONAL PARK.

This story is continued on the railing signs beside you.

RAILING SIGNS

1. HERE THE BATTLE AGAINST WINTER'S KILLING FROSTS IS NEVER LOST. IN THESE STREAMS, WATERCRESS AND OTHER PLANTS GROW ALL WINTER, FORMING A RICH GREEN CARPET FRAMED BY SURROUNDING SNOWS.
2. THE STREAM'S WARMTH REACHES BEYOND ITS BANKS, MAKING THIS AREA LUSHER THAN THE NORMALLY SPARSE MOUNTAIN FOREST. IN THE SPRING, SIX SPECIES OF ORCHIDS ARE FOUND HERE, AS WELL AS PLANTS WHICH USUALLY GROW ONLY AT LOWER ELEVATIONS.

   HELP PRESERVE THIS SPECIAL AREA. IF YOU WANDER OFF THE PATH, EACH STEP COULD CRUSH THE LIFE FROM A RARE WILDFLOWER.

Colour plate - accompanied "

TESTED VERSION

LOWER TRAIL SYSTEM

MARSH OVERLOOK

INTRODUCTION

TROPICAL FISH, ROBINS IN WINTER, AND AN ENDANGERED MINNOW ADD SPICE TO THE SOUP OF LIFE IN THE MARSH BELOW.

This story is continued on the railing signs beside you.

RAILING SIGNS

1. THE ICE-FREE WATER OF THE WINTER MARSH ATTRACTS SEVERAL KINDS OF BIRDS WHICH WOULD NORMALLY FLY SOUTH. THE BOLDLY-MARKED KILLDEER USUALLY WINTERS IN THE SOUTHERN OR COASTAL UNITED STATES, BUT MAY BE SEEN EATING INSECTS FROM THESE WARM WATERS THROUGHOUT THE YEAR.
2. AN EXPERIMENT BY AQUARIUM ENTHUSIASTS HAS ALTERED THE MARSH BELOW. THROUGHOUT THE 1960'S, TROPICAL FISH AND AQUARIUM PLANTS WERE RELEASED THERE. IN THE EVER-WARM WATER, MANY SURVIVED AND REPRODUCED. THESE FISH MAY BE COMPETING WITH A RARE NATIVE MINNOW (SEE NEXT PANEL

   RELEASING ANY NON-NATIVE ANIMAL OR PLANT IS NOW ILLEGAL IN NATIONAL PARKS, SINCE IT MAY UPSET THE NATURAL BALANCE.
3. THE BANFF LONGNOSE DACE IS A MINNOW ESPECIALLY ADAPTED TO THESE WARM WATERS. IT OCCURS NOWHERE ELSE ON EARTH. EVEN HERE IT IS NOW THOUGHT TO BE IN DANGER OF EXTINCTION. COMPETITION FROM AQUARIUM FISH RELEASED IN THIS MARSH MAY HAVE HARMED ITS CHANCES FOR SURVIVAL.
4. (TELESCOPE) FEEL FREE TO USE THIS TELESCOPE TO SEARCH FOR BIRDS OR OTHER ANIMALS IN THE MARSH.

LOWER TRAIL SYSTEM

MARSH OVERLOOK

INTRODUCTION

TROPICAL FISH, ROBINS IN WINTER, AND AN ENDANGERED MINNOW ADD SPICE TO THE SOUP OF LIFE IN THE MARSH BELOW.

This story is continued on the railing signs beside y

RAILING SIGNS

1. THE ICE-FREE WATER OF THE WINTER MARSH ATTRACTS SEVERAL KINDS OF BIRDS WHICH WOULD NORMALLY FLY SOUTH. THE BOLDLY MARKED KILLDEER USUALLY WINTERS IN THE SOUTHERN OR COASTAL UNITED STATES, BUT CAN BE SEEN EATING INSECTS FROM THESE WARM WATERS THROUGHOUT THE YEAR.
2. AN EXPERIMENT BY LOCAL AQUARIUM ENTHUSIASTS HAS ALTERED THE MARSH BELOW. THROUGHOUT THE 1960S, TROPICAL FISH AND AQUARIUM PLANTS WERE RELEASED THERE. IN THE EVER-WARM WATER, MANY SURVIVED AND REPRODUCED. THESE FISH MAY BE COMPETING WITH A RARE NATIVE MINNOW (SEE NEXT PANEL).

   RELEASING ANY NON-NATIVE ANIMAL OR PLANT IS ILLEGAL IN NATIONAL PARKS, SINCE IT COULD UPSET THE NATURAL BALANCE.
3. THE BANFF LONGNOSE DACE IS A MINNOW ESPECIALLY ADAPTED TO THESE WARM WATERS. IT LIVES NOWHERE ELSE ON EARTH. EVEN HERE IT IS NOW THOUGHT TO BE IN DANGER OF EXTINCTION. COMPETITION FROM AQUARIUM FISH RELEASED IN THIS MARSH MAY HAVE HARMED ITS CHANCES FOR SURVIVAL.
4. (TELESCOPE) FEEL FREE TO USE THIS TELESCOPE TO SEARCH FOR BIRDS OR OTHER ANIMALS IN THE MARSH.

TESTED VERSION

LOWER TRAIL SYSTEM

BIRD BLIND

INTRODUCTORY SIGN (AT TURNOFF TO TRAIL)

YOU ARE WELCOME TO USE THE BIRD AND FISH VIEWING BLIND WHICH CAN BE FOUND ____ M DOWN THIS TRAIL. REMEMBER THAT SILENCE IS ESSENTIAL - ANY NOISE WILL FRIGHTEN THE WILDLIFE AWAY.

APPROACH TO BLIND

QUIET!

FISH PANELS

INTRODUCTION

THE FOUR FISH YOU ARE MOST LIKELY TO SEE THROUGH THIS VIEWING WINDOW ARE SHOWN HERE. ALL EAT INSECTS AND SOME ALGAE. THEY COMPETE FOR FOOD, AND PROBABLY EAT EACH OTHER'S EGGS AND YOUNG.

1. MOSQUITOFISH (GAMBUSIA AFFINIS)

AVERAGE LENGTH: FEMALE |——————|

MALE |————|

MOSQUITOFISH WERE INTRODUCED IN 1924 FOR MOSQUITO CONTROL. THIS AGGRESSIVE FISH, NATIVE TO THE SOUTH-EASTERN U.S., IS NOW THE MOST ABUNDANT IN THIS MARSH.

2. SAILFIN MOLLY (POECILIA LATIPINNA)

AVERAGE LENGTH: FEMALE |——————|

MALE |————|

THESE NATIVES OF THE SOUTH-EASTERN U.S. HUG THE SHORELINE NEAR THE WARM INFLOW STREAMS. THE ORIGINAL MOLLIES WERE SOLID BLACK. FROM THESE, SOME CHEQUERED OR MARBLED BLACKS AND A RARE GOLDEN COLOUR HAVE EVOLVED.

TESTED VERSION L

LOWER TRAIL SYSTEM

3. JEWELFISH (HEMICHROMIS BIMACULATUS)

AVERAGE LENGTH: |——————————|

THE SECRETIVE JEWELFISH IS A RARE SIGHT HERE. NATIVE TO AFRICA, IT CAN CHANGE COLOUR, BECOMING BRIGHTER WHEN EXCITED.

4. BANFF LONGNOSE DACE (RHINICHTHYS CATARACTAE SMITHI)

LENGTH:

THIS MINNOW OCCURS ONLY IN THIS MARSH. SPECIALLY ADAPTED TO THE WARM WATER, IT IS NOW RARE AND ENDANGERED.

FINAL VERSION

LOWER TRAIL SYSTEM

BIRD BLIND

INTRODUCTORY SIGN (AT TURNOFF TO TRAIL)

YOU ARE WELCOME TO USE THE BIRD AND FISH VIEWING AREAS ___ M DOWN THIS TRAIL. REMEMBER THAT SILENCE IS ESSENTIAL - ANY NOISE WILL FRIGHTEN THE WILDLIFE AWAY.

APPROACH TO BLIND

PLEASE BE QUIET!

FISH PANELS

INTRODUCTION

THE FOUR FISH YOU ARE MOST LIKELY TO SEE THROUGH THIS VIEWING WINDOW ARE SHOWN HERE. ALL EAT INSECTS AND SOME ALGAE. THEY COMPETE FOR FOOD, AND PROBABLY EAT EACH OTHER'S EGGS AND YOUNG.

1. MOSQUITOFISH (*GAMBUSIA AFFINIS*)

AVERAGE LENGTH: FEMALE ⊢——————⊣

MALE ⊢————⊣

MOSQUITOFISH WERE INTRODUCED IN 1924 FOR MOSQUITO CONTROL. THIS AGGRESSIVE FISH, NATIVE TO THE SOUTH-EASTERN U.S., IS NOW THE MOST ABUNDANT IN THIS MARSH.

2. SAILFIN MOLLY (*POECILIA LATIPINNA*)

AVERAGE LENGTH: FEMALE ⊢——————⊣

MALE ⊢————⊣

THESE NATIVES OF THE SOUTH-EASTERN U.S. HUG THE SHORELINE NEAR THE WARM INFLOW STREAMS. THE ORIGINAL MOLLIES RELEASED HERE WERE SOLID BLACK. FROM THESE, SOME CHEQUERED OR MARBLED BLACKS AND AN OCCASIONAL GOLDEN COLOUR HAVE EVOLVED.

LOWER TRAIL SYSTEM

3. JEWELFISH (*HEMICHROMIS BIMACULATUS*)

AVERAGE LENGTH: ⊢——————————⊣

THE JEWELFISH IS A RARE SIGHT HERE. A COLOURFUL FISH NATIVE TO AFRICA, IT TURNS BRIGHT RED DURING THE BREEDING SEASON.

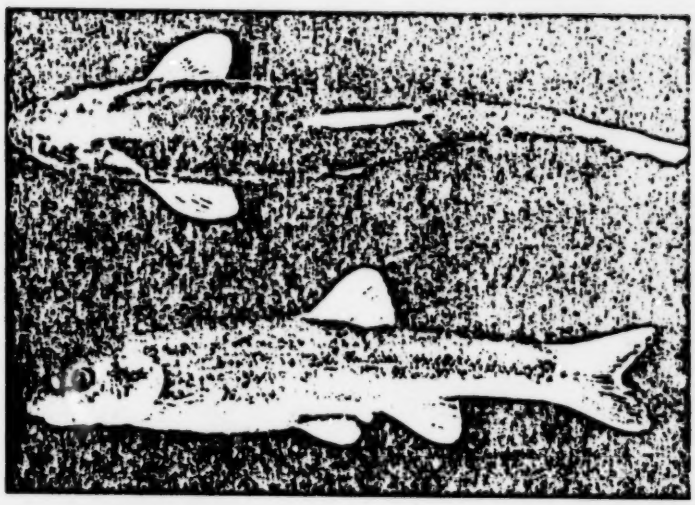
4. BANFF LONGNOSE DACE (*RHINICHTHYS CATARACTAE SMITHI*)

LENGTH: ⊢————————⊣

THIS MINNOW LIVES ONLY IN THIS MARSH. SPECIALLY ADAPTED TO THE WARM WATER, IT IS NOW RARE AND ENDANGERED.

LONGNOSE DACE

Rhinichthys cataractae (Valenciennes)
Rhin ichthys - snout fish
(referring to the long snout)
cataractae - of the cataract
(Niagara waterfall)



Longnose dace adults, 3½ inches standard length, from Graburn Creek, Cypress Hills.

- used with 'Marsh Overlook' texts.

LOWER TRAIL SYSTEM

WINTER BIRD PANELS

INTRODUCTION

THESE NORMALLY MIGRATORY BIRDS SOMETIMES STAY ALL WINTER BECAUSE OF THE WARM, OPEN WATERS OF THE MARSH. FEATURES SHOWN BY ARROWS DIFFERENTIATE THEM FROM SIMILAR BIRDS.

1. THE KILLDEER SEEKS INSECTS IN THE SHALLOW MARGINS OF THE MARSH AND STREAMS. WHEN DISTURBED IT VOICES A REPEATED, RINGING kill-dee.
2. THE ROBIN WITH ITS FLUTE-LIKE SONG IS USUALLY A SIGN OF SPRING. HERE IT HAS BEEN SIGHTED EVEN IN THE COLDEST MONTHS, FORAGING AT WATER'S EDGE FOR INSECTS AND WORMS.
3. THE MALLARD HAS A VARIED DIET OF AQUATIC VEGETATION, SEEDS AND INSECTS. IT FEEDS BY UP-ENDING-- STICKING ITS TAIL STRAIGHT UP AND REACHING DOWN WITH ITS LONG NECK.
4. ZIG-ZAG FLIGHT AND A RASPY CALL DISTINGUISH THE SNIPE. THIS BIRD LIVES NEAR THE MARSH EDGE, USUALLY FLUSHING WHEN DISTURBED.

version 2 - TESTED

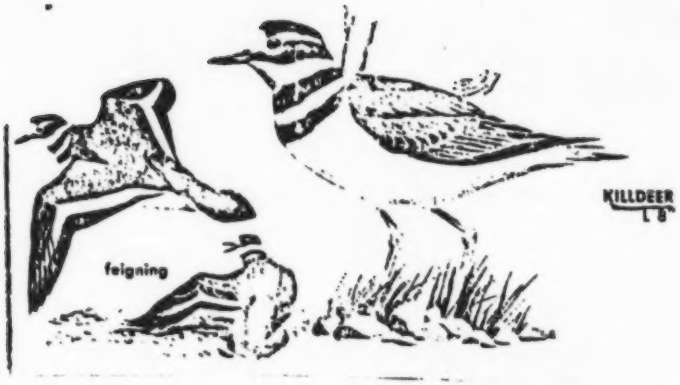
LOWER TRAIL SYSTEM

WINTER BIRDS

EVEN IN THE COLDEST MONTHS OF WINTER, SOME BIRDS STAY HERE THAT WOULD NORMALLY MIGRATE SOUTH. THE WARM, ICE-FREE MARSH WATER CREATES A SPRING-LIKE ENVIRONMENT WHERE INSECTS AND AQUATIC PLANTS PROVIDE FOOD ALL YEAR 'ROUND.

FOLLOWING ARE FOUR BIRDS WHICH ARE KNOWN TO STAY HERE DURING THE WINTER SEASON. FEATURES SHOWN BY ARROWS DIFFERENTIATE THEM FROM SIMILAR BIRDS.

1. THE KILLDEER SEEKS INSECTS IN THE SHALLOW MARGINS OF THE MARSH AND STREAMS. WHEN DISTURBED IT VOICES A REPEATED, RINGING kill-dee,
2. THE ROBIN WITH ITS FLUTE-LIKE SONG IS USUALLY A SIGN OF SPRING. HERE IT HAS BEEN SIGHTED EVEN IN THE COLDEST MONTHS, FORAGING AT WATER'S EDGE FOR INSECTS AND WORMS.
3. THE MALLARD HAS A VARIED DIET OF AQUATIC VEGETATION, SEEDS AND INSECTS. IT FEEDS BY UP-ENDING - STICKING ITS TAIL STRAIGHT UP AND REACHING DOWN WITH ITS LONG NECK.
4. ZIG-ZAG FLIGHT AND A THROATY CALL DISTINGUISH THE SNIPE. THIS BIRD LIVES NEAR THE MARSH EDGE, USUALLY FLYING UP WHEN DISTURBED.


KILLDEER
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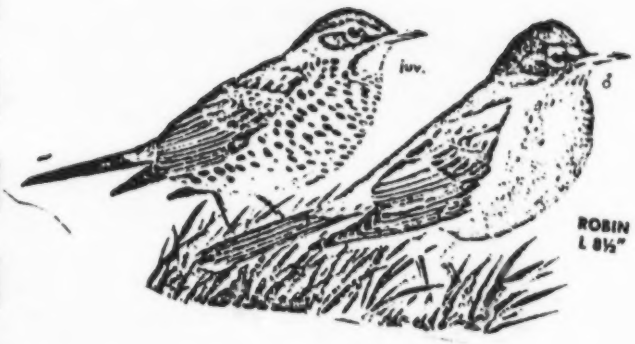
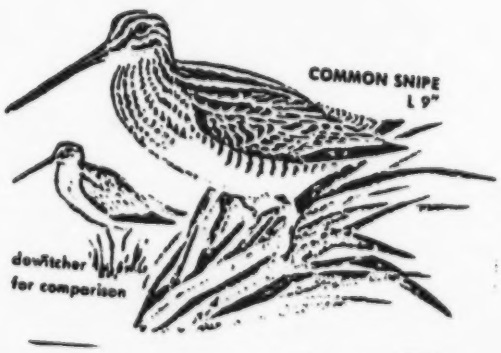

juv.
♂
ROBIN
L 8½"

♀
♂
MALLARD
L 16" W 36"


COMMON SNIPE
L 9"
dowitcher
for comparison

LOWER TRAIL SYSTEM

SUMMER BIRD PANELS

INTRODUCTION

THE FOUR BIRDS SHOWN BELOW COMMONLY NEST HERE. LOOK FOR THE DISTINGUISHING TRAITS SHOWN BY THE ARROWS.

1. NOISY AND ACTIVE, THE YELLOWTHROAT LIVES IN LOW SHRUBS OR VEGETATION TANGLES. THE SONG OF THIS INSECT-EATER IS A LOUD WITchity, WITchity, WITchity.
2. RED-WINGED BLACKBIRDS PERCH ON BUSHES IN OR NEAR THE WATER AND HURL THEIR RAUCOUS CALLS AT EACH OTHER. THEY FEED ON SEEDS AND INSECTS.
3. OUR SMALLEST DUCK IS THE GREEN-WINGED TEAL, WHOSE CALL IS A SHORT WHISTLE. THIS SURFACE-FEEDER IS SECRETIVE DURING NESTING SEASON (JUNE AND JULY).
4. THE TINY RUBY-CROWNED KINGLET LIVES HIGH UP IN EVERGREEN TREES, WHERE IT IS MORE OFTEN HEARD THAN SEEN. ITS BEAUTIFUL SONG STARTS WITH SOFT NOTES, BUILDING UP TO LOUD, ASCENDING TRIPLETS.

version 4-TESTED

LOWER TRAIL SYSTEM

Summer Birds

These four birds commonly nest here during the summer months.
All spend the winter far to the south.
Look for the distinguishing traits shown by the arrows.

1. Noisy and active, the yellowthroat lives in low shrubs or vegetation tangles. The song of this insect-eater is a loud WITchity, WITchity, WITchity.
2. Red-winged blackbirds perch on bushes in or near the water and hurl their raucous calls at each other. They feed on seeds and insects.
3. Our smallest duck is the green-winged teal, whose call is a short whistle. This surface-feeder is rarely seen during nesting season (June and July).
4. The tiny ruby-crowned kinglet lives high up in the evergreen trees, where it is more often heard than seen. Its beautiful song starts with soft notes, building up to loud, ascending triplets.

Yeah - the field guide was used with the Sibley Bird Feeder [illegible]

TESTED VERSION

LOWER TRAIL SYSTEM

SLIMY STOP

INTRODUCTION

HATED BY MANY, CALLED SLIMY BY SOME, THE TWO FORMS OF LIFE SHOWN HERE ARE FASCINATING AND USEFUL MEMBERS OF THIS FOREST COMMUNITY.

This story continues on the railing signs beside you.

RAILING SIGNS

1. WHITE AND COLOURED STRANDS WAVE IN THE CURRENTS OF THESE STREAMS. THEY ARE ALGAE, CLUSTERS OF TINY PLANTS.

   EVERY BODY OF WATER ON THE FACE OF THE EARTH CONTAINS SOME FORM OF ALGAE. SOMETIMES MISTAKEN FOR "POLLUTION", ALGAE ARE THE BREAD AND BUTTER OF WETLAND COMMUNITIES - THE BASIC FOOD SOURCE OF ANIMALS LIVING THERE.

2. SECRETIVE AND RARELY SEEN, THE GARTER SNAKE LIVES ON THIS HILLSIDE. IT BITES ONLY IF HANDLED, AND IS NON-POISONOUS.

   GARTER SNAKES ARE RARE IN THE REST OF BANFF NATIONAL PARK, AND NO OTHER SNAKE OCCURS HERE. THESE COLD-BLOODED ANIMALS CAN'T TOLERATE THE SHORT, COOL MOUNTAIN SUMMERS. HERE THE HOT SPRINGS WARM THE GROUND ENOUGH TO ALLOW THEM TO SURVIVE, HUNTING FOR INSECTS, EARTHWORMS, FROGS AND FISH.

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Version 1

LOWER TRAIL SYSTEM

The Discoverers

Over a hundred years ago, three men struggled up this slope. There was no path then. As they crested the hill, they discovered the Cave & Basin hot springs - warm waters that have changed the course of Canada's history.

These waters continue to affect the lives they touch - those of plants, of animals, and of humans who are still drawn to discover the secrets of the Cave & Basin hot springs.

version 2.
- TESTED

LOWER TRAIL SYSTEM

The Discoverers

You are following in the footsteps of three men who, over a hundred years ago, waded the marsh below and struggled up this slope. They carried an axe, as there was no path then. On cresting the hill, they discovered the Cave & Basin hot springs - warm waters that changed the course of Canada's history.

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POOR

QUALITY

ORIGINAL